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Golfers' experience with multiple imagery interventions and putting performance

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GOLFERS' EXPERIENCE WITH MULTIPLE
IMAGERY INTERVENTIONS AND PUTTING PERFORMANCE

A Thesis

Presented to

The Faculty of the Department of Kinesiology

San José State University

In Partial Fulfillment

of the Requirements of the Degree

Master of Arts

by

SeongKwan Cho

August 2009

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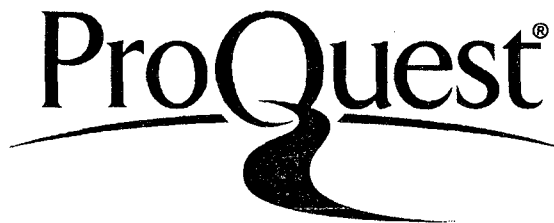
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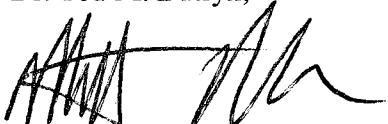
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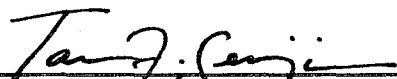
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GOLFERS' EXPERIENCE WITH MULTIPLE IMAGERY INTERVENTIONS
AND PUTTING PERFORMANCE


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ABSTRACT

GOLFERS' EXPERIENCE WITH MULTIPLE IMAGERY INTERVENTIONS AND PUTTING PERFORMANCE

by SeongKwan Cho

The main purpose of this study was to examine participant experiences with imagery use and to investigate both the actual and perceived effectiveness of multiple imagery interventions on golf putting performance. A secondary purpose was to examine the relationship between imagery use and music. The participants were four male college students who were skilled golfers. They first used an imagery guide without music for five consecutive days of intervention sessions and then switched to an imagery guide with music for another five consecutive days. Quantitative data were recorded during putting tests and analyzed using a repeated measures one-way ANOVA. All participants also participated in two semi-structured interviews. The interview data were inductively analyzed to identify themes in the participants' experiences with the interventions. All results are discussed in terms of their relevance to sport psychology applications for performance enhancement. Recommendations for future research are also discussed.

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CHAPTER 1

Introduction

Psychological skills are an important practice to consider when identifying effective activities for improving an athlete's performance (Cumming & Hall, 2002b). Several psychological techniques, including the use of imagery, are believed to contribute to enhanced performance in a number of physical tasks (Beauchamp, Bray, & Albinson, 2002). Imagery, unlike dreaming, is an experience which is consciously and purposely created or re-created by using and combining all the different sensory modalities (e.g., the visual, kinesthetic, auditory, and olfactory senses) within the mind without external stimuli (Callow & Hardy, 2005; Gould, Damarjian, & Greenleaf, 2002; Murphy, 1994; Vealey & Greenleaf, 2006; White & Hardy, 1998). As Weinberg and colleagues stated, "researchers have long been interested in the study of imagery and its effect upon motor and skilled performance" (Weinberg, Butt, Knight, Burke, & Jackson, 2003, p. 26).

Many athletes use imagery both as an important psychological skill, and also to improve performance. This type of imagery practice usually involves more than one sensory modality, and the effective use of polysensory imagery is positively correlated with sport performance. The two most important sensory modalities used in imagery are the visual and the kinesthetic (Farahat, Ille, & Thon, 2004). Visual imagery is the ability to clearly see the specified images, whereas kinesthetic imagery is the ability to clearly feel imaged body movements and other physical sensations (Abma, Fry, Li, & Relyea, 2002). Thus the kinesthetic sense is often recommended for athletes (Gould et al., 2002; Murphy, 1994; Weinberg & Gould, 2007). Furthermore, the successful use of imagery is

contingent on how realistically the athlete can create images. According to Gregg, Hall, and Nederhof (2005), “the better imager an athlete is, the more effective that imagery will be in aiding his or her performance or skill acquisition” (p. 94). By extension, the more athletes practice imagery, the more skillful at imaging they become.

Imagery also involves both external and internal perspectives. In the external imagery perspective, the athlete takes a third-person viewpoint, as if watching himself or herself in a film, whereas in the internal imagery perspective, the athlete imagines his or her performance while simultaneously seeing and feeling himself or herself physically doing the skill (Farahat et al., 2004). The athlete’s use of an internal versus external imagery perspective is also associated with sport performance (Gould et al., 2002; Murphy, 1994; Weinberg & Gould, 2007). The combination of external imagery perspective with kinesthetic imagery is intimately related to performance improvement (Hardy & Callow, 1999).

Imagery has been used for several different purposes in sports, including specific skill acquisition or rehearsal, strategy mastering or rehearsal, goal-oriented behaviors, and the mediation of psychological states such as confidence, arousal, and anxiety (Gould et al., 2002; Hall, Mack, Paivio, & Hausenblas, 1998; Martin, Moritz, & Hall, 1999; Pavio, 1985; Weinberg & Gould, 2007). Athletes use imagery more in competition than in practice, which suggests they may use imagery more to enhance performance than to learn skills (Munroe, Giacobbi, Hall, & Weinberg, 2000). However, athletes also use imagery during the off-season (Cumming & Hall, 2002a). Several studies (Cumming & Hall, 2000a; Hall et al, 1998; Hall, Rodgers, & Barr, 1990) suggest that elite athletes are

more likely to use imagery in practice, competition, and during the off-season than non-elite athletes. More highly competitive athletes also perceive imagery to be more relevant to performance than less competitive athletes (Cumming & Hall, 2002b).

Recent research has found a positive correlation between imagery and athlete confidence (Callow & Hardy, 2001). In particular, negative imagery significantly reduces confidence and performance, and reduced confidence is associated with unstable imagery and negative performance (Taylor & Shaw, 2002). In addition, highly confident athletes are more likely to use imagery than less confident athletes (Abma et al., 2002).

Videotapes and audiotapes are often used to help athletes develop and use more effective imagery. Videotapes include self-modeling, observing a model, or highlights of a best performance, and these visual aids mainly create kinesthetic imagery and confidence with an external perspective (Gould et al., 2002; Weinberg & Gould, 2007). Audiotapes can be made for many specific purposes, not only to rehearse performance but also to control psychological states such as confidence during imagery rehearsal (Gould et al., 2002; Weinberg & Gould, 2007). A specific piece of music which may help an athlete's imagery use can be added to videotapes to give cues or triggers for specific sensory experiences such as kinesthetic feelings of movements or skills. Athletes can listen to the music to trigger these essential feelings, for example, during competition (Gould et al., 2002). Recent research (Bishop, Karageorghis, & Loizou, 2007) has indicated that self-selected music positively affects imagery use and helps athletes control emotional states such as confidence and relaxation. Moreover, previous research (Pates, Karageorghis, Fryer, & Maynard, 2003) suggested that combining

imagery use and self-selected music elicited the flow state in athletes and enhanced their performance.

Researchers have also found a relationship between specific sports, imagery use, and performance (Hall et al., 1998; Munroe, Giacobbi, Hall, & Weinberg, 2000; Weinberg et al., 2003). For example, athletes in team sports use imagery differently from those in individual sports (Hall et al., 1998). In addition, research has suggested that athletes use the functions of imagery differently for different sports (Munroe, Hall, Simms, & Weinberg, 1998).

The psychological component of golf is generally considered one of the game's most important aspects, and some extremely successful golfers have described imagery as the most crucial factor in their success (Bunker, 2006). For example, Jack Nicklaus first uses an internal perspective to visualize how the ball flies and where it lands, then shifts to an external perspective to see his swing and make it real (Weinberg & Gould, 2007). Tiger Woods also uses a combination of sensory modalities, such as visual and kinesthetic, for optimal performance (Weinberg & Gould). Previous studies have also suggested that imagery indirectly affects putting performance (Beauchamp et al., 2002); that is, imagery can affect the golfer's confidence and thus his or her ability to improve putting (Beauchamp et al.). Moreover, using audio and video information for imagery interventions has been shown to improve putting performance (Smith & Holmes, 2004).

Statement of Purpose

Previous research has examined imagery use in golf, and recent studies suggest a significant correlation between imagery and golf performance, especially in putting

(Short et al., 2002; Smith & Holmes, 2004; Ploszay, Gentner, Skinner, & Wrisberg, 2006; Taylor & Shaw, 2002). However, few studies have qualitatively examined golfers' experiences with imagery use after imagery interventions (Ploszay et al., 2006). In addition, previous research has found that imagery can improve golf performance, especially putting, by increasing confidence (Beauchamp et al., 2002). Furthermore, music positively affects imagery use and manipulates emotional states such as confidence and relaxation (Bishop et al., 2007; Pates et al., 2003), although no research has specifically studied the effectiveness of imagery use with music on putting.

Therefore, the main purpose of this mixed-methods study was to explore participants' experiences with imagery use, and to examine both the actual and perceived effectiveness of multiple imagery interventions on golf putting performance. A secondary purpose of this study was to understand the relationship between imagery use and music.

Definition/Description of Terms

1. Imagery: is defined as making a picture in the mind using as many sensory modalities as possible without real experience (Callow & Hardy, 2005; Gould et al., 2002; Murphy, 1994; Vealey & Greenleaf, 2006; Weinberg & Gould, 2007; White & Hardy, 1998).
2. Visual imagery: is defined as the ability to clearly see the specified images (Abma et al., 2002).
3. Kinesthetic imagery: is defined as the ability to clearly feel imaged body movements and other physical sensations (Abma et al., 2002).

4. External imagery perspective: is defined as the athlete imagining himself or herself from a third-person viewpoint, as if watching himself or herself in a film (Farahat et al., 2004).
5. Internal imagery perspective: is defined as the athlete imagining his or her performance while simultaneously seeing and feeling himself or herself physically doing the skill (Farahat et al., 2004).
6. Experienced golfer: is defined as a golfer with intermediate to advanced skills, as indicated by a regular gross handicap score between 72 and 92 (Gregg & Hall, 2006).

Delimitations

This study was delimited to the following participants:

1. Participants who were college students between 18 and 23 years old.
2. Participants who were experienced golfers and whose gross handicap score was between 72 and 92.
3. Participants who had no formal experience with imagery intervention prior to the study.

This study was delimited to the following instruments:

1. Demographic questionnaire.
2. Sport Imagery Questionnaire (Hall et al., 1998), which was used to assess the use of different imagery functions by the participants.
3. Two interview guides.

Limitations

The findings of this study may include the following limitations:

1. The small number of participants may limit the generalizability of the findings.
2. The findings of this study may have limited application to other golf skills and situations, such as driver shots, iron shots, and performance on a real course.
3. The participants' expectations may have limited the findings of this study.
4. The participants' practice of putting and imagery use may have affected the findings of this study.
5. Regular putting tests during the study may have affected the participants' putting performance.

CHAPTER 2

Review of Literature

Imagery use has been studied extensively. This chapter reviews the literature related to imagery use, imagery interventions, and imagery interventions with visual and/or audio information in sports, particularly golf.

Functions of Imagery

Paivio (1985) found that imagery influenced human motor performance, and proposed a framework in which imagery served both cognitive and motivational functions at both general and specific levels. Cognitive specific imagery was used for imaging specific skills, whereas cognitive general imagery was used to image general strategies of play. Specific motivational imagery was primarily used for goal-oriented behaviors, whereas general motivational imagery was associated with arousal management.

However, Paivio's framework (1985) had some limitations. For example, it did not include situational or personal factors such as the sport context or the athlete's imagery ability, which could determine the type and effectiveness of the imagery used by the athlete (Martin, Moritz, & Hall, 1999; Salmon, Hall, & Haslam, 1994). In addition, Martin et al. found that there were few predictions about how specific types of images correlated with specific cognitive and motivational changes in athletes.

Furthermore, Hall, Mack, Paivio, and Hausenblas (1998) found that athletes used more types of imagery than were accounted for in Paivio's (1985) framework. Hall et al. developed the Sport Imagery Questionnaire (SIQ) and identified five functions of

imagery (Appendix A) based on Paivio's theoretical model: Cognitive Specific (CS), Cognitive General (CG), Motivational Specific (MS), Motivational General-Arousal (MG-A), and Motivational General-Mastery (MG-M). According to Hall et al., the five types of imagery were functionally orthogonal. That is, athletes might use these different types of imagery either independently or in combination to achieve successful behavioral and cognitive outcomes.

Cognitive Specific (CS) imagery involves the rehearsal of specific sport skills. Athletes use CS imagery for both skill development and execution. Skill development is associated with learning a skill, mainly during practice, whereas skill execution is related to performing in a specific situation, typically competition. Hence, CS imagery is an effective technique for enhancing both learning and performance. Cognitive General (CG) imagery is the imagery associated with the mental rehearsal of plays and strategies. CG imagery is associated with strategy development, mainly for learning strategies in practice, and with strategy execution, for improving execution in both practice and competition.

On the motivational side, Motivational Specific (MS) imagery represents specific goals and goal-oriented behaviors such as "winning a medal and being applauded or congratulated for a good performance" (Hall et al., 1998, p. 87). There are two types of goals: performance and outcome. Performance goals involve imaging the achievement of a goal, while outcome goals, which are further divided into team and individual goals, involve imaging winning and other specific results. Motivational General imagery is divided into two categories: Motivation General-Arousal (MG-A) and Motivation

General-Mastery (MG-M). MG-A imagery is imagery that represents feelings of relaxation, stress, arousal, and anxiety in conjunction with sport competition. MG-A imagery is effective for helping athletes feel aroused during practice, controlled in pre-competition, or relaxed in pre-competition. In contrast, MG-M imagery is used to image effective coping and mastery, such as confidence and focus in challenging situations such as competition.

According to Hall et al. (1998), elite athletes are more likely to use the motivational functions of imagery than non-elite athletes. Specifically, elite athletes use MS and MG-M imagery more than non-elite athletes. This is because elite and more competitive athletes are concerned with performing well and achieving their goals, and use imagery to keep themselves motivated. Non-elite and less competitive athletes use more CS and CG imagery because they are concerned with skill improvement, so for them, the cognitive functions of imagery are more effective. In addition, athletes in team sports use the motivational functions of imagery, especially MS and MG-M imagery, more than athletes in individual sports.

Imagery Use in Sports

Barr and Hall (1992) examined the use of imagery in rowing. Three hundred and forty-eight rowers (211 males and 137 females) participated in this study. They ranged in skill from novices just starting to compete, to world champions. The participants completed the Imagery Use Questionnaire (IUQ) modified for use in this study. The study found that most of the participants had used other mental training techniques, including relaxation, focusing, meditation, and self-talk, and that the elite level rowers

used these other techniques more than the novices. Most of the rowers used imagery in general for racing. In addition, the study participants used an internal visual perspective with kinesthetic feelings more than an external visual perspective. They mainly used the motivational functions of imagery, especially MS imagery such as “winning the race” (Barr & Hall, p. 249). Furthermore, they used MG-M imagery to build self-confidence. Age had no correlation with imagery use.

In contrast, Gregg and Hall’s (2006) results suggested that age and imagery use were negatively correlated; that is, the older the athlete, the less imagery was used. Rowers under age 25 used an external visual perspective more than rowers over age 25. The rowers visualized their entire stroke more than part of the stroke, whereas they imaged part of the race more than the whole race. However, their imagery sessions were not very “structured and regular” (p. 249). The majority of the rowers (i.e., 62% of the participants) reported that they had not used imagery when they were injured or away from rowing.

Short and Short (2005) explored the relationship between imagery use and confidence level in athletes. Their study participants were 79 male collegiate football players from the same team, playing the positions of offense, defense, and special teams such as punters, kickers, and snappers. In the pre-interview, 21% of the players reported using imagery in their training. The Movement Imagery Questionnaire-Revised (MIQ-R) was used to assess visual and kinesthetic imagery ability. The Sport Imagery Questionnaire (SIQ) (Hall et al., 1998), revised for this study, and the Trait Sport

Confidence Inventory (TSCI) were also used. All players first completed the MIQ-R, SIQ, and TSCI.

The modified SIQ data indicated that the more confident football players used more MG-A, CG, and CS imagery than the less confident players. In addition, according to the modified SIQ results, more confident players tended to use MG-M, CG and CS imagery, while less confident athletes used more MG-A and MS imagery. However, this study had the limitation that the modified SIQ had not been validated statistically.

Callow and Hardy (2001) examined 124 female netball players with at least two years of experience, from four different counties in the UK. Fifty-six players were recruited from the two lowest-ranked counties in netball, and 68 players from the two highest-ranked counties. The SIQ (Hall et al., 1998) was used during training sessions to assess the athletes' use of different types of imagery. The State Sport Confidence Inventory (SSCI) was administered before games to assess the athletes' levels of confidence that they would win.

According to the study results, athletes with different skill levels used different types of imagery. Less skilled players mainly used CG imagery. In particular, athletes who were less skilled but highly confident used more MG-M and CG imagery, and less MG-A imagery. Thus they were more likely to use imagery for technically challenging situations and game strategies than to control arousal and anxiety. In contrast, athletes high in both skill level and confidence used MS imagery. Thus, they were more likely to use imagery for goal achievement. The authors concluded that skill level and sport type should be considered crucial variables influencing the relationship between self-

confidence and imagery use. In addition, they suggested that future research should study the correlation between types of imagery and functions of imagery.

Imagery Use in Golf

Beauchamp, Bray, and Albison (2002) studied the relationships between pre-competition imagery, self-efficacy, and golf performance. Fifty-one Canadian male university varsity golfers participated in this study. In accordance with Bandura's suggested method, they completed the self-efficacy questionnaire 1 day before the Provincial Golf Championship. Within 10 minutes of completing their competition round, all participants used the modified SIQ to retrospectively record their use of imagery during the hour immediately before the start of the round.

The results suggested that MS, MG-M, MG-A, and CS imagery significantly affected participants' performance. This was consistent with another study (Hall et al., 1998) indicating that MG-M imagery was predictive of performance in elite athletes. In addition, MG-M, MS, CS, and CG imagery were associated with self-efficacy. The relationship between self-efficacy and golf performance with pre-competition imagery implied that MG-M imagery was "one mechanism through which self-efficacy might influence performance" (Beauchamp et al., 2002, p. 704). In addition, there was a significant correlation between self-efficacy and performance. Highly efficacious golfers tended to use MG-M imagery more than less efficacious golfers. However, the authors stated that MG-M imagery was "a mediating variable" (p. 703). That is, self-efficacy did not significantly affect golf performance when the imagery was controlled. However, the

generalizability of these results may be limited by the fact that all participants were male and of different athletic levels (e.g., national and recreational).

Taylor and Shaw (2002) examined the effect of outcome imagery on golf putting performance and on golfers' self-confidence in deliberate putting competition. The participants consisted of both unskilled and skilled golfers. The 25 unskilled participants (21 males and 4 females) were all students with no previous golf experience. The 26 skilled golfers (25 males and 1 female) were golf studies students with an average handicap of 7. A deliberate putting competition for the study was announced. The winners would receive cash prizes and their scores would be posted on the clubhouse board. All participants performed under three different conditions: the control condition, using their usual normal putting technique without imagery; the positive imagery condition, where they were instructed to focus on a positive image before each shot; and the negative imagery condition, where they were instructed to focus on one of four different negative images before each putt. Their putting errors were recorded and their self-confidence was assessed.

This study indicated that, for both unskilled and skilled golfers, only the negative imagery conditions were significantly associated with putting errors. No association was observed for the positive or control conditions. The performance of all participants was noticeably lower for the negative imagery condition than for the other two conditions. In addition, self-confidence scores were higher for the positive imagery and control conditions than for the negative imagery condition. Unskilled participants made more putting errors than skilled participants, but no significant difference in self-confidence

was observed for unskilled versus skilled participants. MS imagery for outcome and MG-M imagery for challenging competitive situations and self-confidence were used in the study. Both MS and MG-M imagery had little influence on either performance or self-confidence. These findings suggest that while negative imagery is strongly associated with reduced performance and self-confidence, positive imagery is not strongly associated with increased performance or self-confidence. Thus, golfers should avoid visualizing negative images. Positive imagery may be useful when golfers lose self-confidence or have negative thoughts. In addition, the result that “outcome imagery influences performances through the mechanism of confidence” (Taylor & Shaw, 2002, p. 612) was consistent with Beauchamp et al.’s findings (2002). However, there are some limitations to the generalizability of these results: the cash prizes may have affected putting performance and confidence, and some participants had prior experience with using positive imagery.

Gregg and Hall (2006) studied the relationship between imagery use, skill level, and age in golfers. Three hundred four golfers (213 males, 86 females, and 5 unspecified) participated in this study. The participants were given the SIQ to measure the five functions of imagery (Hall et al., 1998). The questionnaire was revised slightly to be more specific to golf. All participants reported their handicaps. They were asked to complete the SIQ after a round of golf.

The results indicated that most golfers used MG-M frequently and MS rarely. The handicap was negatively associated with the five functions of imagery. In addition, older golfers used CG, CS, and MG-M imagery less often than younger golfers.

Handicap and age were positively correlated; that is, older golfers had higher handicaps than younger golfers. Thus, handicap was a significant predictor of imagery use. These results were consistent with those of Cumming and Hall (2002b), who found a positive correlation between skill level and imagery use. They were also consistent with the findings of Hall et al. (1998) that elite athletes used imagery more than non-elite athletes. Gregg and Hall (2006) also found that age was a significant predictor of the use of cognitive functions of imagery. Furthermore, the relationship between handicap and age significantly predicted the use of MG-M. The study suggested that all five functions of imagery should be used with higher handicap golfers.

Imagery Intervention with an Athlete

Evans, Jones, and Mullen (2004) quantitatively and qualitatively studied the use of imagery by an elite rugby union player and the effects of an imagery intervention in a practical performance environment. The intervention was designed to help the participant use imagery more effectively. The participant was a 23-year-old male who had 11 years of rugby experience and was a member of the National “A” team in the UK. Interviews and the Sport Imagery Questionnaire (SIQ) were used to assess him during the regular rugby season. He also kept a diary to record his use of imagery.

The results of this study were not consistent with previous research. For example, the participant mainly used the cognitive rather than the motivational functions of imagery to enhance self-confidence and control anxiety. In contrast, Hall et al. (1998) found that most athletes used MG-M, MG-A, and MS imagery to enhance motivation, to

control arousal and stress, and to gain and maintain self-confidence as a way to generate an appropriate activation state.

Imagery Intervention with Golfers

Ploszay, Gentner, Skinner, and Wrisberg (2006) assessed the effectiveness of multisensory imagery on golf putting performance. Four Division I collegiate varsity golfers (two males and two females) participated in this study, and none of them were starters on their team. Thus, they expected to improve their putting skills by participating in the study. Their initial putting performance was assessed using different distances from the holes. Based on the number of successful putts, participants received interventions for 15 minutes a day on five days during one week and were then re-tested to determine post-treatment performance. During this time, they were also interviewed. Both the number of successful putts and the total distance of missed putts from the center of the hole were recorded for each golfer.

The study results were somewhat equivocal. One participant immediately increased the number of successful putts and reduced the missed distance, but the others had very different results. In addition, one golfer had used imagery on a consistent basis prior to participation in the study; the rest had not, although all participants seemed to feel that the intervention helped improve their performance. Participants reported that the intervention particularly helped them “read the green accurately, visualize the line of the putt more clearly, and improve their overall confidence” (Ploszay et al., 2006, p. 254). Thus, it can be assumed that participants mostly used CS, CG, and MG-M. However, this study had the limitation that in the interviews, all four athletes stated that they

participated to improve their putting skill. Therefore, their pre-expectations may have affected the results. The authors concluded that the combination of multisensory imagery and rehearsal of performance could be an effective method for enhancing a specific sport performance such as putting.

Short et al. (2002) examined the effect on golf putting of imagery function and direction in relation to self-efficacy and performance. Eighty-three students (47 males and 36 females) volunteered for the study. The Movement Imagery Questionnaire-Revised (MIQ-R) was used to assess visual and kinesthetic imagery ability. Self-efficacy was measured and the number of each participant's successful putts was recorded to check putting ability. All participants performed several initial putts during which the researchers assessed their skill level. The assessment results were used to divide the participants into four different groups at different distances from the holes. The MIQ-R was administered, the four groups repeated the putting sequence, and the MIQ-R was administered again. Participants were then randomly assigned to one of six imagery groups or to a control group that used no imagery. The six imagery groups were as follows: CS facilitative imagery, CS debilitating imagery, MG-M facilitative imagery, MG-M debilitating imagery, CS imagery only, and MG-M imagery only. Each group received detailed instructions for their assigned imagery intervention. The participants used the imagery and then repeated the putting sequence. The MIS-Q was then re-administered to all groups including the control group.

The results indicated that both CS and MG-M imagery affected self-efficacy, but that the results differed by gender. Male self-efficacy increased more with CS imagery

than MG-M imagery. However, females were the opposite: self-efficacy increased more with MG-M imagery. Moreover, when direction (facilitative or debilitating) was added, the facilitative component was associated with higher self-efficacy in males; however, in females, the MG-M debilitating groups scored slightly higher in self-efficacy than the MG-M facilitative groups. These results did not match previous findings by Martin et al. (1999) that MG-M imagery had a stronger effect on self-efficacy.

Imagery Intervention with Visual or Audio Information in Sports

Hall and Erffmeyer (1983) studied the effect of visuo-motor behavior rehearsal (VMBR), which combines both visual imagery and relaxation, with videotaped modeling on free throw accuracy. Ten highly skilled female players from an intercollegiate basketball team volunteered for the study. The participants were randomly placed in one of two conditions: progressive relaxation and visual imagery with videotaped modeling or without visual information. In the pretest, the participants performed 20 free throw shots daily for 5 days. In the 2 week training period, all participants received 30 minute progressive relaxation and visual imagery training for 5 days of the first week. For 5 days of the second week, the participants practiced for the first 20 minutes. In the latter 20 minutes, the video intervention group viewed a videotape with realistic sounds. "The videotaped model was filmed from behind so that each viewer could imagine herself as the one taking the shot" (p. 344). After watching the video tape for 2 minutes, the participants closed their eyes and imaged their own successful free throw shot, then watched the video again. The video group also completed a visual imagery questionnaire. During this time, the control group continued using progressive relaxation

and visual imagery of perfect free throw shots. In the posttest, the participants performed 20 free throw shots, and the video group completed the imagery questionnaire again.

The study indicated that the video intervention group significantly improved their free throw performance. The participants in this group made the remarkable observation that they experienced kinesthetic feelings and internal perspective (i.e., the first person viewpoint) during imagery, whereas they watched the video from the external perspective (i.e., the third person viewpoint). In addition, the authors concluded that using visual modeling made the participants more proficient with VMBR, which also contributed to improved performance. However, the generalizability of the results may be limited by the fact that all participants were highly skilled players.

Imagery Intervention with Visual or Audio Information in Golfers

Smith and Holmes (2004) assessed the effect of different imagery intervention modalities on golf putting performance with 49 experienced golfers. In accordance with previous research (Hardy & Callow, 1999), only 40 participants were selected for this study after completing the Vividness of Movement Imagery Questionnaire (VMIQ) and scoring less than 75. They were all male and had handicaps of less than 12. All participants were amateur golfers, but they were individually playing on their countries' teams. After the screening procedure, the 40 participants were randomly divided into four groups: a written script group, a video group, an audio group, and a control group. The pretest involved 15 practice putts and 15 test putts at a 3 meter distance from the test hole. The number of putts holed was counted and every 15 putts were scored regardless of whether they went in (e.g., 5 points were given for each putt holed and 1 point for each

putt that pulled up short). The practice period consisted of 15 putts twice a week for 6 weeks, plus imagery interventions once a day. The posttest was 15 putts. Diaries were used to confirm the amount of imagery performed and participants' adherence, and for participants to write about their experiences with the imagery interventions. All participants were restricted from additional putting practice or participation in any golf matches during this study. The intervention for the audio group used "the noise created by the putter striking the ball and the ball dropping into the hole" (p. 389). Each participant in the audio group had his own sound (i.e., the sound was recorded individually for each participant). The video tapes were individually filmed from an internal perspective as the audio tapes were recorded. In addition, a written script based on previous research was created from each individual's information.

In this study, all four groups (audio, video, written-script, and control groups) improved both putts holed and putting performance scores. However, only the audio and video groups performed significantly better than the written-script and control groups. Comparing between-group differences, there were no significant differences between the audio and video groups or between the written-script and control groups in terms of improvement in the number of putts holed. In addition, the audio and video groups had real time performance experience during their imagery, whereas the written-script group had problems with timing. The results of this study have significant implications for imagery interventions and instructions because participation in the audio and video intervention groups "not only ensured a sensory imagery experience on the part of the performer, but also ensured that the timing of the imagined action would be identical to

that of the actual movement, thereby attempting to optimize temporal functional equivalence” (Smith & Holmes, 2004, p. 393). The authors suggested that future studies use an actual golf course to verify meaningful environmental information and to apply real situations. They also suggested doing similar studies involving other sports.

Psychological Aspects of the Use of Self-Selected Music in Sports

Pates, Kargeorghis, and Maynard (2003) assessed the effects of self-selected music on flow state and shooting performance in three female college netball players. The Flow State Scale (FSS) was used to investigate the participants’ flow experience. In the baseline phase of this study, participants completed a baseline test. Immediately after completing this test, the participants were asked to recall both images and feelings related to the flow experience. They were also instructed “to rehearse an image of flow and to imagine performing from an internal perspective” (p. 420). Finally, the participants selected a song that elicited flow experience feelings. During the intervention phase, the participants listened to their self-selected songs during 10-minute shooting trials. After completing these trials, the participants completed the FSS, and also a questionnaire designed to qualitatively assess their experience.

The study results showed that all three participants improved their performance during the intervention phase, and two of them also experienced increased flow. One participant stated that the music helped her be more focused and in the zone. The authors concluded that self-selected music and imagery could be combined to manipulate flow-related emotions and cognitions in order to enhance performance.

Bishop, Kargeorghis, and Loizou (2007) qualitatively studied the use of self-selected music as a performance strategy to manipulate athletes' emotional states. Fourteen participants, seven women and seven men, were selected from an international junior tennis center in London, England. In the pre-interview, the participants were asked to select songs from among 2024 songs compiled by the first author. They were also asked to write down five emotional states that they considered vital for success in tennis, such as psyching up, relaxation, and dissociation. During the interviews, the participants listened to their self-selected music while discussing these emotional states with the researchers.

The study results indicated that the participants were able to use their self-selected music to promote the desired emotional states. They also experienced visual and auditory imagery when listening to their music. The music tempo and intensity were crucial factors in manipulating emotional states. For example, a slower tempo was associated with relaxation, whereas higher intensity and a faster tempo were associated with psyching up.

Summary of Literature Review

This review of the literature suggested a relationship between skill level and the use of different functions of imagery. Studies involving team sports such as rugby, football, and netball suggested that athletes mainly used the motivational functions of imagery, especially MG-M. However, less skilled athletes also used the more cognitive functions, such as CG imagery. The research results for rowing were similar. Most

participants used the motivational functions, especially MS and MG-M imagery.

However, novices also used CS imagery to improve skills.

In studies of golf, most participants used all motivational functions. They often emphasized MG-M imagery to increase self-confidence. Some golfers also used the cognitive functions of imagery. In addition, more skilled players used all five functions of imagery, whereas less skilled players rarely used all five functions. Moreover, imagery interventions with visual or audio information improved golf putting performance more than traditional interventions such as using written scripts only.

Studies of the use of music in sports (Bishop et al., 2007; Pates et al., 2003) indicated that participants' self-selected music elicited specific images and feelings related to their performance. Music also allowed participants to manipulate their emotional states such as confidence, relaxation, and focus. Moreover, self-selected music with imagery use facilitated the participants' flow state, which enhanced performance.

This review of literature presented several quantitative studies on imagery use in relation to athletic performance. However, limited qualitative research on this subject was found, especially in relation to golf. In addition, there appeared to be no previous research on combining imagery with music to enhance golf performance. Therefore, by using a mixed-methods design, the main purpose of this study was to explore participants' use of imagery, to examine their actual and perceptions of its effectiveness on putting performance, and to better understand the relationship between imagery use and music.

CHAPTER 3

Methods

The main purpose of this mixed-methods study was to examine participants' experiences with imagery use, and to investigate the actual and perceived effectiveness of multiple imagery interventions on golf putting performance. A secondary purpose of this study was to understand the relationship between imagery use and music. This chapter first describes the participants and the research design. It then details the instruments and equipment used in the study, and describes the procedures involved in using the different imagery interventions.

Participants

After obtaining approval from the San José State University Human Subjects Institutional Review Board, the researcher personally contacted college golf instructors in Santa Clara County, California, to obtain permission to visit their intermediate and advanced classes. The researcher briefly described the study to the golf students in these classes and gave a demographic questionnaire to potential participants who expressed interest in the study. The researcher carefully reviewed their demographic questionnaires and then recruited four participants who met the study requirements related to golf handicap and age (Gregg & Hall, 2006). Because none of the female students met the handicap requirement, all four participants were male. However, it is unlikely that this affected the study results, because according to previous research (Gregg & Hall, 2006; Hall, Mack, Paivio, & Hausenblas, 1998), gender differences do not significantly affect imagery use. Two of the participants were Asian-American and two were Caucasian.

The participants' handicaps were between 82 and 90. Their ages ranged between 18 and 23 years. The narrow age range was used due to Gregg and Hall's findings that age is significantly related to imagery use, and that different age groups are biased toward different imagery use. The number of participants was based on and consistent with previous intervention-based research (Ploszay, Gentner, Skinner, & Wrisberg, 2006).

Research Design

To obtain in-depth, meaningful data, this study used a mixed-methods approach combining both quantitative and qualitative methods. Quantitative methods, via the SIQ and the putting scores, were used to investigate participants' use of different functions of imagery and improvement of imagery use, and the effectiveness of the multiple imagery interventions on putting performance. Qualitative methods, via in-depth interviews, were used to explore the participants' experience with imagery use and its perceived effectiveness, and to shed additional light on the quantitative research results (Creswell, 2007). Moreover, due to the lack of research on the relationship between imagery use and music, qualitative methods were used "to understand the underlying experiences, feelings and emotions" (Gratton & Jones, 2004, p. 23) during the imagery interventions.

Instrumentation and Equipment

Demographic Questionnaire

The researcher designed a demographic questionnaire (Appendix B) to record each participant's name, age, school, year in school, years of golf experience, golf handicap, and knowledge of imagery. However, the main purpose of the questionnaire

was to verify handicaps and ages, and thus to select participants who met the criteria for this study.

Sport Imagery Questionnaire (SIQ)

The SIQ, designed by Hall, Mack, Paivio, and Hausenblas (1998), is a 30-item self-report questionnaire for assessing athletes' use of imagery, and has been used to investigate imagery use in various sports (Callow & Hardy, 2001; Evans, Jones, & Mullen, 2004; Short & Short, 2005). The SIQ contains thirty 7-point Likert scale items grouped into five categories, one for each of the five functions of imagery: cognitive general (CG), cognitive specific (CS), motivational general-arousal (MG-A), motivational general-mastery (MG-M), and motivation specific (MS). The 7-point Likert scale, from 1 (*rarely*) to 7 (*often*), is used to report how frequently participants use each of the five functions of imagery. The test items are categorized as follows: cognitive specific (7 items), cognitive general (6 items), motivational specific (5 items), motivational general-arousal (6 items), and motivational general-mastery (6 items).

Hall et al. found the SIQ to be a reliable and valid test of athletes' use of the five functions of imagery. In addition, the use of the SIQ is consistent with previous research on golf (Beauchamp, Bray, & Albison, 2002; Gregg & Hall, 2006). In this study, for compliance with the use of the SIQ, the most recent version of the SIQ (Appendix C) was used to monitor and evaluate changes in the participants' use of imagery during the intervention sessions (Hall, Stevens, & Paivio, 2005).

Semi-structured Interview Guides

The researcher designed two semi-structured interview guides (Appendices D and E) and conducted two interviews with each of the four participants to obtain qualitative data throughout the study. The interview guides included questions about basic imagery components, including cognitive and motivation functions, visual and kinesthetic ability, external and internal perspective, and confidence. Prior to the interviews, an expert in qualitative research reviewed the interview guides and provided suggestions that were incorporated into the final guides. The questions included open questions and probing questions to explore the participants' experience with imagery use, imagery ability, imagery perspective, and confidence.

Imagery Intervention Script

Participants used a written imagery intervention script designed by the researcher. The script was approved by San José State University sport psychology professors, a golf instructor with a Professional Golfers' Association (PGA) Class A teaching certification, and a professional golfer with 10 years of competitive experience. The final written script (Appendix F) included sections exploring all functions of imagery (that is, cognitive and motivational functions), imagery ability (that is, visual and kinesthetic), imagery perspective (that is, internal and external), and confidence. This was consistent with previous research (Ploszay et al., 2006; Short et al., 2002; Smith & Holmes, 2004).

Imagery Intervention Guide without Music

The researcher recorded a visual imagery intervention guide on DVD based on the written imagery script. In this visual imagery guide, a model demonstrated the putting techniques described in the written script. The model was a professional golfer with 10 years of competitive experience, and currently training for the PGA Class A teaching certification. The visual imagery guide also included pre-recorded verbal instructions identical to those in the written script. These instructions were based on previous research (Hall & Erffmeyer, 1983; Smith & Holmes, 2004). The guide also included the realistic sound of a golf ball being putted into the hole (Smith & Holmes, 2004). The PGA Class A golf instructor reviewed and approved the recorded visual imagery guide. The total length of the visual guide was 3.5 minutes. Participants used this guide on Days 1-5 of the study.

Imagery Intervention Guide with Music

According to previous research (Bishop, Karageorghis, & Loizou, 2007), when participants listened to self-selected music, it reminded them of clear visual images related to their performance and goals, even without physical stimulus.

For the second week of intervention sessions, participants were asked to choose a song that they thought would help them to use imagery, to focus, and generally to mediate their emotional state. Participants either gave the researcher the name of their selected song, or emailed the song file to the researcher.

The researcher then prepared individual visual imagery guides for each participant by replacing the pre-recorded verbal instruction with the participant's self-

selected music. That is, each participant used an imagery guide containing the previously used visual images, but with their own music replacing the verbal instruction.

Participants used this guide on Days 6-10 of the study.

Voice Recorder

The researcher used a Philips GoGear digital audio player to record participant interviews during the intervention sessions. The researcher also used this device to store the participants' self-selected music, so that they could listen to it during their practice putts during the second week of intervention sessions before the actual putting tests.

Intervention Guide Media Players

All visual imagery guides were stored on an LG-IBM (X-40) laptop computer and an Apple iPod Classic 120 GB. Participants used these devices to view the appropriate guide during the imagery intervention with practice putts before the putting tests.

Golf Equipment

Consistent with previous research on imagery use, participants used their own putters and balls in order to keep their pre-shot routine consistent during putting performances and tests (Ploszay et al, 2006; Smith & Holmes, 2004).

Putting Surfaces

Consistent with previous research on imagery use, the participants performed all putting tests on outdoor practice putting greens at actual golf courses (Ploszay et al., 2006).

Procedures

This study used the following procedures: a first meeting with a pre-test; five imagery intervention sessions on consecutive days with the visual imagery guide, and with putting tests on Days 3 and 5; a second meeting; and five imagery intervention sessions on consecutive days with the visual imagery guide with music, and with putting tests on Days 7 and 10. Thus participants practiced a total of 10 imagery intervention sessions over two weeks. This number and timing of sessions is consistent with previous research (Ploszay et al., 2006). All interview dates and putting tests were scheduled individually. These procedures are described in detail below and are also presented in Appendix G.

First Meeting with Pre-test

In the first meeting with the participants, the researcher explained the main purpose and procedures of this study, and asked the participants to carefully read and then sign an informed consent form (Appendix H). The researcher then conducted the pre-test, in which the participants performed a putting test involving 10 putts from a 12-foot (3.66-meter) distance. Advanced golfers consider this putting distance to be very difficult (Guadagnoli, Dornier, & Tandy, 1996). The participants were asked to perform their normal pre-shot putting routine. The researcher scored each participant's putting results, and the participants completed the SIQ after the test.

After the pre-test, the participants and the researcher scheduled convenient times for putting tests and interviews. At this time the researcher also gave each participant a DVD recording of the visual imagery guide with pre-recorded verbal instructions and

without music. The participants were asked to watch the DVD at least once a day, and to practice their imagery use and putts on putting greens.

First Set of Imagery Intervention Sessions: Without Music

The first set of imagery intervention sessions took place on five consecutive days. Participants performed the sessions on Days 1, 2, and 4 on their own. In these sessions the participants were instructed to watch the visual imagery guide, to practice their imagery use, and if possible, to practice putts on actual putting greens. On these days the researcher was not physically present, but sent the participants text messages reminding them to watch the visual imagery guide and practice imagery use during the sessions.

Participants took two putting tests, on Days 3 and 5. In the putting tests, the researcher placed markers in 12 different locations, each of which was 12 feet from the hole, and drew four 5-cm lines, each of which was one foot from the hole (Appendix I). The participants performed 10 practice putts from any marker(s) they chose. No imagery interventions were used. After the practice putts, the participants received imagery interventions for 10 to 15 minutes by watching the visual imagery guide on the laptop or iPod. The participants were asked to use imagery with physical rehearsal based on the intervention guide, and then to repeat 10 putting trials from any of the 12 markers.

After the putting test on Day 5, the participants completed the SIQ and participated in a semi-structured interview (Evans et al., 2004). To preserve the original content, the interviews were recorded on a voice recorder with the participants' consent. During the interviews, the researcher also recorded noteworthy information on paper.

Second Meeting

The second meeting between each participant and the researcher took place the day before the start of the second set of five imagery intervention sessions. In this meeting, the researcher gave each participant a personalized DVD containing the visual imagery guide and that participant's self-selected music. The participants were asked to watch their DVD at least once a day, and then to listen to the music while practicing their imagery use and putts on putting greens.

Second Set of Imagery Interventions: With Music

The second set of imagery intervention sessions took place over five consecutive days. In the imagery sessions on Days 6, 7, and 9, the researcher instructed the participants to watch their visual imagery guides, and then to listen to the music while practicing their imagery use and putts on putting greens.

As with the first set of sessions, participants had two putting tests, on Days 8 and 10. In the putting tests, consistent with the first set of sessions, participants performed 10 practice putts from their choice of twelve 12-foot distance markers. After practicing, the participants were asked to perform their imagery with physical rehearsal for 10 to 15 minutes while listening to their self-selected music. In contrast to the first set of intervention sessions, they received no visual imagery for their putting tests. They then performed 10 trials from the same distance as in the first sessions, and the researcher scored each participant's putting results.

Participants completed the SIQ and had a semi-structured interview after the putting test on Day 10. As before, the interviews were recorded on a voice recorder and the researcher also recorded noteworthy information on paper.

Data Analysis

Qualitative Analysis

The researcher transcribed the recorded interview data verbatim. After carefully reading each transcript several times to gain familiarity with the data, the researcher inductively coded and structured the data into raw data themes and higher order themes (Côté, Salmela, Baria, & Russell, 1993; Gratton & Jones, 2004). At the same time, using the basic five functions of imagery components as a guide, the researcher deductively analyzed the data to categorize meaningful participant responses (Côté et al., 1993). The researcher and an expert in qualitative research discussed the themes during peer review meetings. The participants were also asked to verify that the transcripts were correct (Amis, 2005).

Quantitative Analysis

For the analysis of the SIQ, the researcher added up the scores in each category and divided the scores by the number of items in the category. The SIQ data were only used to investigate participants' overall use of imagery, and to note any changes in their use of the five imagery functions during the interventions (Evans et al., 2004).

For the analysis of the putting tests, the researcher scored each participant's tests by assigning 5 points to each ball holed in, 3 points to each ball that missed the hole by a distance of one foot (30 cm) or less, and 0 points for each ball that missed the hole by

more than one foot (30 cm) (Smith & Holmes, 2004). In addition, the researcher conducted a repeated measures one-way ANOVA to investigate the effectiveness of multiple imagery interventions on the participants' putting performance.

Trustworthiness

Several methods were used to establish the trustworthiness of the data and the analysis, and to further enhance the rigor of the study. First, to develop trust and rapport (Amis, 2005), the researcher had casual conversations with the participants, mainly about golf, during the first meeting. The researcher also answered all participant questions about his own golf background and demonstrated any golf skills requested. Second, to verify "the accuracy of the researcher's interpretation" (Amis, 2005, p. 125), the researcher asked the participants to check their own transcripts and make corrections if needed. Third, for triangulation (Amis, 2005), the researcher used several data collection methods including interviews, questionnaires, observation, and the researcher's own notes during tests and interviews. As an additional data collection method, for consistency with previous research (Evans et al., 2004), participants were asked to keep personal diaries to record their imagery use, thoughts, experiences, and perceptions for the duration of the study. The diary data were used to triangulate the interview data, but were not analyzed using the same coding technique as was used for the interview data. Finally, peer reviews with an expert in qualitative research were conducted at several points during the data analysis process. The peer reviewer read all of the interview transcripts and provided commentary on them. The peer reviewer also met with the

researcher to issue challenges and present negative cases to prompt the researcher to defend choices made during the data analysis process.

Summary

The main purpose of this mixed-methods study was to examine participants' experiences with imagery use, and to investigate the actual and perceived effectiveness of multiple imagery interventions on golf putting performance. A secondary purpose of this study was to shed light on the relationship between imagery use and music. This chapter described the methodology designed by the researcher to investigate these questions. Specifically, this chapter described the study design, participants, instruments, and procedures involved in using two different imagery interventions, one without music and one with music.

CHAPTER 4

Results and Discussion

This chapter gives a brief profile of each participant and presents the qualitative findings from the interviews, participant diaries, and the researcher's field notes. It also presents the quantitative results from the SIQ data and the putting tests.

Participant Profiles

This section gives a brief profile of each participant. These profiles were assembled from the demographic data, casual conversations during the first participant meeting to build trust and rapport, and the researcher's field notes.

David

David was in his second year of junior college. He had approximately 10 years of golf experience and had been a member of the Northern California Golf Association (NCGA) for two years. His average golf score was 82. David played out on the course at least once a week and went to the practice range twice a week. He had participated in recreational tournaments to gain experience. He had never taken formal golf lessons, but had taught himself several golf swings and other techniques. Significantly, he had already used imagery, but had not used formal imagery interventions. David seemed very confident about his golf performance and believed that his knowledge of golf was at the professional level. David often asked the researcher questions about golf, and also asked him to demonstrate specific golf swings such as driver shots during their meetings. His selected music was "Prodigal," recorded by OneRepublic.

Andrew

Andrew was in his second year of junior college. He had only two years of golf experience, but took formal golf lessons twice a week, and played out on a course at least once a week. He had also been a member of the NCGA for two years. His average golf score was 89. Andrew and David were close friends, often playing out together, and were extremely competitive despite their friendship. Andrew had heard of imagery and understood it in general, but had rarely used it in practice or on a course. He described his putting as “not good.” He sometimes missed putts from as little as three feet (91.44 cm) from the hole. He seemed interested in this study and excited about improving his putting performance. He selected the song “Somewhere Over the Rainbow” recorded by Israel “Bruddah Iz” Kamakawiwo’ole.

John

John was a senior at a four-year college. He had four years of golf experience. During the summers of his freshman and sophomore years he had worked at the front desk of a golf course, and had practiced and played out every day. He had also taken golf lessons for approximately one year. John stated that his average score had been 80 when he worked at the golf course, but was now around 90. He no longer had time to practice or play due to his schoolwork, his after-school weekday job, and his search for an internship or full time job. He knew imagery was an effective technique for enhancing overall golf skill, but had never used it. He also stated that he had once been a very skilled putter, but was nervous about it now because he had not practiced putting in over a year. John selected Haydn’s “Serenade” for his music.

Kevin

Kevin was a senior at a four-year college. He had more than 10 years of golf experience, and his average score was 88. His father had taught him to play, and he and his parents had played out together at golf courses at least once a week. When he transferred to his current college from another school in Southern California, he began playing soccer instead of golf. However, he planned to focus on golf again after graduating and moving back to Southern California. Kevin seemed very confident about his skills. Although he had not practiced putting for a while, he expected to hole in all his putts during the study. His selected music was “Eye of the Tiger,” recorded by Survivor.

First Interviews

The researcher interviewed each participant on Day 5 after completion of the putting test and the SIQ. To accommodate the participants’ busy schedules, interviews were conducted in the clubhouses of the golf courses used for the putting tests. The first interview addressed the participants’ experiences with imagery use while performing putting. Five general categories emerged from the imagery components (Munroe, Giacobbi, Hall, & Weinberg, 2000) and the interview data: imagery ability, imagery perspective, cognitive functions of imagery, motivational functions of imagery, and overall effectiveness. The following sections discuss these thematic categories and the sub-themes identified within each. The thematic analysis process is presented in Appendix J.

Imagery Ability

Imagery ability is the ability to use one or more of the five senses (visual, kinesthetic, auditory, olfactory, and gustatory) to make the image more vivid and realistic (Farahat, Ille, & Thon, 2004). Farahat et al. suggested that for athletes, the most important imagery abilities were the visual and kinesthetic, that is, the ability to clearly visualize and/or clearly feel the image used in the intervention. These researchers also indicated that athletes did in fact use the visual and kinesthetic imagery abilities more often than the auditory, olfactory, or gustatory. The category of imagery ability has two sub-categories: visualization and the feeling of force.

Visualization. In this study, the higher order theme of visualization referred to the participants' ability to clearly visualize what they imagined. Consistent with previous research findings (Farahat et al., 2004), all four participants experienced and used visualization during the first set of five interventions (Days 1-5). They described it in terms and phrases such as "could see," "visualizing," "watching," "looking," "spinning in my head," "visual connection," and "more clear because I'm a visual person."

Two participants, Kevin and Andrew, used only the visual ability aspect of imagery, whereas the other two also used the kinesthetic ability. Kevin in particular described himself as a highly visual person:

Imagery gives me a more visual connection with what I'm doing, with my actions. So it helps me because I can see what I'm about to do, and kind of visualize that in my head... you know, keep that in my head and just keep on spinning this, keep playing it like a movie over and over. I could visualize it, I could see it, but feeling... it didn't come naturally. But seeing it, it was more visual and I'm [a] more visual person, so it became more clear for me on the seeing side.

Feeling of force. The higher order theme of the feeling of force referred to how clearly participants kinesthetically felt what they imagined performing, such as the tightness of their shoulder muscles, the grip strength with which they held the putter, and the precise force needed to hit the ball to hole it in. Two participants experienced the feeling of force, using such phrases as “feel the amount of force” and “how hard I have to hit it.” David elaborated on this:

I’m watching, and I’m looking at the spot... [and] I feel like I know exactly how hard I have to hit it. You know, or just like letting my arms swing, and I feel the tempo that I need to get my ball in there [the hole].

According to David’s description, while he used visual ability in general, he specifically used the feeling of force to putt accurately. This use of the kinesthetic imagery ability in putting is consistent with previous research results by Hall, Rodgers, and Barr (1999). These researchers suggested that the ability to image a kinesthetic feeling and sense of control was extremely effective in enhancing closed skills requiring precise performance.

Imagery Perspective

The general category of imagery perspective refers to whether participants imagine themselves, or their performance, from a first-person or third-person perspective. This category of imagery perspective is divided into two sub-categories: internal and external.

Internal. Three participants used internal imagery during the first set of five interventions. The participants used the phrase “imagine the putter head swinging back and forth” to describe their internal imagery. They also used such terms and phrases as “internally imagine,” “aim towards the line,” “concentrate on the ball,” “imagine the

hole,” “look at the ball marker and the line to the hole,” and “only see the putter and the ball.” John described his internal perspective experience during the first five interventions as follows:

What I do is, I kind of break myself into parts and I only see my putters, I only see the ball, [and] I only imagine, internally imagine my shoulders and my arms and my wrists holding the putter. So, I try to imagine myself in parts in relation to the performance.

External. Within the higher order theme of perspective, two participants used external imagery during the first set of interventions. To describe this they used phrases such as “third-person view” and “imagining myself.” Kevin stated that he used the external perspective in all the sports he played, including golf:

I see myself as a third person [point of view]. It’s not only in golf but other sports that I play. I see myself performing and sometimes I visualize myself performing from [a] third person’s [point of] view. When I perform, I don’t so much concentrate on my internal mechanics of each individual [body] part.

Kevin’s use of external perspective imagery in putting is consistent with previous research by Hardy and Callow (1999), who suggested that external imagery was significant in the acquisition of skills that required precise form and technique. Callow and Hardy (2004) further suggested that using external imagery with kinesthetic imagery was highly effective in enhancing performance when form was a crucial component.

David reported that he used both internal and external perspectives within the same imagery session, starting with the internal and then switching to the external:

I internally imagine that I aim toward the line that I want and I really have to make sure that this part is pretty straight... it’s really important for me to put the ball behind the marker. So, I find the [imaginary] line that I want and then put the ball in front of the marker [so that it’s] on that same line... I can [externally] imagine myself taking a few steps back to look at the line again.

David's use of these two imagery perspectives supports research by Hall et al. (1990) that indicated that athletes often switched back and forth between internal and external imagery perspectives in order to imagine their performance with as much precision as possible.

Cognitive Function

The cognitive function of imagery is one of the five general categories of imagery function evaluated in the SIQ (Hall et al., 1998). The cognitive function of imagery is related to the rehearsal, acquisition, execution, and enhancement of skills. It is also related to routines and strategies of play (Munroe et al., 2000). In this study, four higher order themes emerged within the cognitive function category: imaging performance, reading the green, strategy, and consistent new routine.

Imaging performance. The higher order theme of imaging performance referred to the rehearsal and execution of a specific skill. Only Kevin used this function during the first five intervention sessions. As he explained it, "I can see myself doing it [putting] and, you know, visualize it before I do it. And so I can do it." This description was similar to the cognitive specific item from the SIQ which states that "before attempting a particular skill, I imagine myself performing it perfectly" (Hall, Stevens, & Paivio, 2005, p. 37).

Kevin's statement that "I can do it" indicated that his use of the cognitive function of imagery was also associated with self-confidence. Thus he used cognitive imagery as a motivational function as well as a cognitive function. This was consistent with results from the study by Short, Monsma, and Short (2004) which indicated that the cognitive

function in the above SIQ item was also associated with confidence as a motivational function.

Reading the green. Putting involves two distinct and equally important skills: reading the green and drawing an imaginary line from the ball to the hole. The higher order theme of reading the green refers to the cognitive function associated with assessing the green surface. Conditions such as dryness, slope, and direction of the grass affect the ball's travel after it is hit. Therefore, reading the green is a necessary precursor to hitting the ball so that it actually follows the imaginary line to the hole. This skill is particularly important in golf because no two greens are alike. Andrew used the cognitive function of imagery to learn specific skills to improve his putting:

[I'm] just moving my putter and I'm already thinking what the line will be. I imagine the line, and then with the putter, all I imagine is how far back the putter has to go and then forward and then the ball should follow that line... Then I set the ball and I think [image] what the line is.

Andrew noted that he used to misread lines, especially in long putts of 12 feet or more.

During the first set of interventions, he learned to read the green; however, he recognized that he still needed more practice both in using imagery and in actually reading the green. This was consistent with previous research (Gregg & Hall, 2006; Hall et al., 1998) on the use of imagery in learning a skill.

Strategy. The higher order theme of strategy refers to how well athletes execute their own plans for performance. In this study, strategy referred to the golfer's selection of the path along which the ball would travel to the hole, and to the golfer's visualization of this path as an imaginary line. The participants in this study described strategy using such terms and phrases as "draw the line and practice the putt," "think about strategies,"

and “strategize myself.” Two of the study participants, John and David, used imagery in their performance strategy. John described his experience as follows:

My strategy was to, you know, follow the imaginary line that I drew, with a couple practice strokes. I think the imagery use definitely helped, especially for putting [in an actual] golf game because I was able to kind of strategize myself.

David reported using auditory information in his imagery for his putting performance strategy:

I imagine the putt going into the hole and that sound [when the ball holes in]. That’s what I’m always thinking about, that sound, that click, click, click, click.

David’s experience was consistent with the findings of Short et al. (2004), which indicated that the cognitive function for strategies was also used for other functions such as motivation.

Consistent new routine. The raw data themes that emerged within the consistent new routine category were “consistent routine,” “preparation,” “practice strokes as my routine,” and “visualizing and following the visual guide.” All participants developed consistent new putting routines during the first set of five interventions. Two of the participants reported that before the interventions, they had not used consistent putting routines. Thus they had not consistently performed practice swings before putting. Andrew described his reaction upon incorporating the new, consistent routine provided in the first set of interventions, which included practice swings before putts:

I started doing it [using the imagery from this intervention] and it became more comfortable. So there’s just a type of routine... Yeah, it [imagery] helped because I think the biggest part is, with me... I was too tense. I mean when I do the routine, it’s like, I’m just another, another [new] swing. I just think about my two practice swings behind, before I hit and then I hit... Not thinking and not rushing it.

Andrew also reported that before the intervention he was “too tense” when putting; however, after adding two practice putts to his routine, he felt relaxed and “more comfortable.” Thus, like David, he used the cognitive function of imagery to control his emotional state; that is, he used the cognitive function as a motivation function also. This was consistent with the findings of Short et al. (2004).

Motivational Function

Athletes can use the motivational function of imagery for several purposes, including setting goals such as holing in a certain percentage of putts or winning a specific race. Competitive athletes often use this function to maintain the high level of competitive interest they need to achieve their goals (Hall et al., 1998). The motivational function of imagery can also be used to increase or reduce arousal and to cope with performance-related stressors (Nichols, Holt, & Polman, 2005). The four higher order themes that emerged in this category were auditory imagery, increased arousal, confidence, and focus.

Auditory imagery. The higher order theme of auditory imagery referred to the participant’s use of imaged sounds as a motivational function of imagery to achieve a goal. As an example of the raw data within this theme, David mentioned “hearing the clicking sound” as a “reward,” and used this auditory imagery in his specific goal image:

I need to putt [the ball] in so that I, I hear that sound... because if I forget that sound, then it tends to make me be a worse putter. So I always have to keep on hearing that sound... I think the most important thing is just, for me at least, is thinking about that sound of the ball going in the cup because, you know, it’s like when you put a piece of cheese in front of a mouse, it wants to go for it. It’s a reward.

David had used imagery before participating in this study, but his imagery routines had not included an auditory component. Now, however, he felt certain that the “click” of a ball holing in, indicating a successful putt, provided relevant cues for his putting. In other words, he had begun using auditory imagery for both cognitive and motivational functions. This was consistent with findings by Smith and Holmes (2004). These researchers did not specifically examine the relationship between the use of imagery functions and audio imagery in putting performance. However, their results did indicate that putting performance improved significantly with the use of imagery guides that included audio information only, with no visual information.

Increased arousal. The higher order theme of increased arousal referred to the imagery functions that heightened participants’ levels of physiological, mental, or emotional activation. The raw data themes that emerged within this theme were arousal and excitement. Two participants reported that their arousal levels were substantially higher during the intervention than previously. Kevin described his experience as follows:

When I play some sports, I feel the excitement and arousal of high performance or performing well, and the way people recognize the performance. So you know, I visualize [that] I’m performing really well in other people’s point of view and... [get] very excited. And I can visualize that before things happen and try to do the same thing in real life.

Some aspects of Kevin’s description were not related to increased arousal, but were associated with other motivational functions such as self-confidence. This was consistent with the findings of Short et al. (2004) that “the image served more than one function” (p. 346).

Confidence. The higher order theme of confidence included the raw data themes of self-talk and confidence. In this study, all four participants experienced confidence about holing in their putts. For two of the participants, this sense of confidence increased. As John described it,

After the intervention, I try to tell myself, “Okay, I’m going to follow my strategies and I’m going to make the putt.” So I think my confidence level that I’ll be making the putt, I think that’s the biggest gain.

The other two participants were already extremely confident, and this did not change during this study. Kevin said that although he experienced competitive confidence during the interventions, he did not think his confidence level increased significantly. This suggested that for highly confident golfers, motivational functions might not significantly affect their use of imagery for either coping or mastery. That is, motivational functions might not increase their confidence or focus in competition or other challenging situations. This suggestion may be relevant to the findings of Beauchamp, Bray, and Albison (2002) that high self-efficacy without imagery use did not significantly predict golf performance.

Focus. The higher order theme of focus referred to the participants’ use of specific images to cope with situations they perceived to be stressful or challenging.

John described his experience of imagery, focus, and putting performance as follows:

I think imagery, you know, rehearsal, I think it helped me not feel the stress because I’m focused on my performance in parts. So I only think about my strategies and executing my strategies in parts. I only focused on... okay, I’m gonna roll my putt in towards the hole... I focused on executing the strategy. So I didn’t feel much stress.

John used both cognitive and motivational functions to block stress, but primarily relied on cognitive functions. His description closely matched the cognitive items on the SIQ (Hall et al., 2005), but did not match the motivational items. Short et al. (2002) found that participants interpreted imagery content differently as cognitive, motivational, or both.

Overall Effectiveness

The general category of overall effectiveness referred to the totality of the participants' experience with imagery use and putting performance. Positive and negative factors emerged as the two higher order themes in this category.

Positive factors. The higher order theme of positive factors referred to factors that enhanced imagery use, putting performance, and application to other situations. The terms and phrases used to describe positive factors included "closer to the hole," "good rhythm," "good physical condition," and "can apply in different ways and in different parts of life."

John reported that his putting improved as a result of the intervention. He said that while his putts did not always hole in, they now got close enough to the hole so that he could hole in on the next putt:

The number of putts that I made [holed in] hasn't really improved a lot, but I think the execution, and you know, where I missed, and how closely the putts that I missed, it definitely shows that the intervention has positively affected my golf putting game.

John's observation was consistent with the findings of Ploszay, Gentner, Skinner, and Wrisberg (2006), which also indicated that multisensory imagery helped golfers reduce the distance by which their putts missed the hole.

Kevin commented that after participating in this study, he intended to use imagery in other areas of his life as well as in golf:

It's good to recognize that this is actually a technique I can apply in different ways, in different parts of life. The same method, and you know, maybe I was doing it before, but maybe I didn't realize I was doing it, but it's good to know that there's techniques out there that I can apply.

This result suggested that imagery intervention techniques used in sport might also have application to other life situations.

Negative factors. The higher order theme of negative factors referred to factors that hindered imagery use, putting performance, and/or application to other situations. Participants described these negative factors using such terms and phrases as “negative image,” “negative thoughts,” “don’t feel confident,” and “physically not good response.”

Two participants described how negative thoughts and images disturbed their imagery use in putting performance. David said that whenever he started thinking that the ball would not hole in, he became increasingly tense, and his putting performance deteriorated. He therefore tried to block out negative thoughts and images. This blocking strategy closely matched Taylor and Shaw’s suggestion (2002) that golfers should avoid negative imagery because it was strongly associated with reduced performance and self-confidence.

David also stated that when he felt physically tense or tight, he concentrated on these physical sensations and forgot to use imagery. Thus his ability to use imagery depended on how he felt physically before he played. His description of the relationship between his physical sensations and imagery use indicated that although he recognized the effectiveness of imagery, and used it in putting, he did not use it to reduce physical

tension. The association between physical condition and imagery use has not been discussed in previous studies, because these studies did not consider the participants' daily physical condition. Thus, as an extraneous variable, physical condition may be associated with the results and effectiveness of imagery use.

Summary

The participants primarily used and experienced the visual imagery ability, that is, the ability to visualize images of themselves and their putting performance. All four participants used the visual imagery ability, and two of them used only this ability, whereas the other two also used kinesthetic imagery. In the imagery perspective category, all participants used the internal perspective. One participant also used the external perspective, which was consistent with the findings of Hall et al. (1990) that athletes used both perspectives to imagine their performance in as much detail as possible. All four participants used the cognitive functions of imagery to develop consistent new routines. However, some participants also used these cognitive functions to motivate themselves. This result was consistent with previous research (Short et al., 2004) suggesting that a specific imagery function could also be used for other functions. The participants used the motivational functions of imagery mainly to mediate their confidence. One participant primarily used auditory imagery to motivate himself. All participants experienced negative factors that weakened their imagery use or worsened their putting performance. However, after participating in the first set of interventions, all participants improved their putting performance; they could get their putts very close to the hole even

if they did not actually hole in. A final result from the first set of interventions was that one participant stated his intention to apply the same techniques to other areas of his life.

Second Interviews

The researcher conducted the second interview with each participant on Day 10 immediately after the participant completed the putting test and the SIQ. As with the first interview, to accommodate the participants' schedules, the second interview was conducted in the clubhouse of the golf course where the participant had taken the putting test. The second interview addressed the participants' experiences with imagery use and music during putting. As in the first interviews, five general categories emerged that paralleled the structure of the interview guide: imagery ability, imagery perspective, cognitive functions of imagery, motivational functions of imagery, and overall effectiveness of imagery with music. The following sections discuss these thematic categories and the sub-themes identified within each. The thematic analysis from the second interviews is presented in Appendix K.

Imagery Ability

The category of imagery ability referred to how clearly the study participants could visualize or kinesthetically feel what they imaged. The participants reported that music helped their imagery abilities during the interventions, as described below.

Visual connection. The higher order theme of visual connection referred to the fact that music helped participants connect visually with what they imaged. The raw data themes that emerged within this higher order theme included "visually seeing the movement in relation to the music," "overlaying the image," and "matching the image."

Three of the four participants experienced visual connection when they used imagery with music. One participant, David, did not. In his first interview, he displayed the ability to visualize what he imagined, but in his second interview, he reported that music did not help him create a visual imagery connection.

In contrast, John stated that the visual connection helped him visualize his movements more effectively in the second set of interventions:

I was trying to remember the melody and the music itself and also trying to match [how] the image related to the motions that were related to the music... Visually, yes, I did [visualize by] overlaying that music onto the image and the video clip [the visual guide]. I was able to discern part of the music. The melody itself was connected to the movement in the clip and I was able to connect those two. So, when I kind of stand over to go through my mechanics, I think it helped me visually see the movement or see the clip in relation to the music.

The participants reported that music facilitated their ability to experience the visual connection with their imagery. This was consistent with previous research by Bishop, Karageorghis, and Loizou (2007) which indicated that participants experienced specific visual images when they listened to self-selected music.

Clearness. The higher order theme of clearness referred to the ways in which music enhanced the vividness and detail of the participants' imagery. Two raw data themes emerged: seeing more by thinking less, and seeing more clearly because music "cleared the head."

Two participants reported that they experienced increased clearness. According to David, "It's more clear. I think it's always clear, but with the music, [it] helps me clear my head. So not a lot of things are in my head other than just putting." The participants stated that they could clearly visualize their desired images while listening to

music. However, they also stated that this was not because of the music per se, but because listening to music allowed them to block out other thoughts and focus on visualizing specific images. For example, as David described it:

In the second intervention, because it's my own music, you know, I think of what I imagine, or listening to music, I was able to focus on the images more clearly, where I would see, you know, say, the putting head going back and forth first... because listening to music blocked things [distractions] out, everything out to focus on what I imagined.

Positive feelings. The raw data themes that emerged in this category were described by participants as “good feelings” or “relaxed feelings” during their imagery practice. Both John and Andrew experienced positive feelings during the second set of interventions, but described their experiences somewhat differently. According to John, “kinesthetically, there weren't much [many] actions or movements that I had to worry about. More of a relaxed feeling, I think that's what I felt [when I used imagery].” Similarly, Andrew stated, “Can I feel what I imagined? Yeah, I thought I did because the strokes felt good, and everything felt good [during my imagery practice].”

John reported that when he used imagery with music, he felt less worried about his overall awareness of his movements, and became more physically relaxed. Thus John's feelings were concordant with the motivational functions of imagery. In contrast, Andrew felt what he imagined; that is, his feelings were directly connected with his kinesthetic imagery ability.

Imagery Perspective

The general category of imagery perspective addresses whether participants imagine themselves or their performance from a first-person or third-person point of

view. The category of imagery perspective is divided into two sub-categories: internal and external.

Internal. All four participants experienced internal imagery use during the second five interventions. The terms and phrases they used to describe this perspective included “first-person point of view,” “imagining the ball and the putter,” and “moving the putter and hitting the ball.” The internal perspective was essentially the same as in the first set of interviews. The participants used it to see specific motions and subjects such as the ball and the putter. This may have been because precise putting requires the golfer to keep the head down and focus only on the ball.

External. Within the higher order theme of the external imagery perspective, three participants experienced this perspective during the second five interventions. These participants described the external perspective using such phrases as “a third person’s view” and “as other people looking at me.” These participants stated that they used more external than internal perspective imagery. However, as in the first five interventions, some participants used both internal and external perspective imagery at the same time, or switched between perspectives as needed. John said he used external perspective for motivation and confidence, whereas he used internal perspective for accurate putting.

Cognitive Function

In the second interview, the general category of the cognitive function was similar to that in the first interview. Two higher order themes emerged in this category: performance improvement and routine.

Performance improvement. The higher order theme of performance improvement referred to a cognitive specific imagery function normally used to improve athletes' specific skill or performance. In the cognitive category, participants reported more performance improvement in the second interview than in the first. The raw data in this higher order theme included such phrases as "fluidly going through the back stroke and the follow through," "getting an even rhythm and tempo," "reading the line," and "performance improvement." Andrew used cognitive imagery for performance improvement:

I can see the ball or see what it's gonna do better So, I'm, I use the imagery... I imagine it [and] like using it. When I'm standing behind [the ball], imagining what it's gonna do. While I'm taking my practice strokes, imagining like how far back [and] how far forward [the putter] should be going.

David stated:

I was able to actually get better tempo watching the second imagery. So my putts had more of an even tempo all throughout [them]... I try to imagine it... even the rhythm tempo and I try to do it as much as [I can]. I think it's gonna take awhile. I'm just focusing on the hole, like the distance between me and the hole. And then when I have that tempo that's right for that distance... then I try to execute the same tempo that I did on the practice swing.

The cognitive imagery function is typically used for skill acquisition and improvement (Hall et al., 1998; Munroe et al., 2000).

Routine. The higher order theme of routine referred to creating a strategy for improving putting performance. In the first and second interviews, participants stated that having a consistent routine was a crucial strategy for putting. However, in the second interview, two participants reported using cognitive imagery for their routine, whereas all four participants reported using it in the first interview. That is, they might

have developed their own routines because they had practiced the same putting performance during the first and second interventions. One participant, John, stated that he already had a routine based on the first set of interventions: "From the first [interventions], I was able to set the routine and build up my own mechanics."

Motivational Function

The motivational function of imagery is used for goal setting or to achieve goals, to control arousal, and to cope with challenging situations. Five higher order themes emerged in this category: goal setting, increasing arousal, controlling arousal, focus, and confidence.

Goal setting. The higher order theme of goal setting referred to the imagery function that helped participants select goals. The raw data themes within goal setting were sinking the putt, focusing on the hole, and using the correct amount of energy to make the putt.

Consistent with previous research (Barr & Hall, 1992; Hall et al., 1998; Munroe et al., 2000) two participants used the motivational function to achieve their goal. David stated that "it kind of let me focus and think about what my goal is, and my goal is to sink the putt, right, to put the ball in the hole... You know, energy to put the ball into the hole."

Increased arousal. As with the first interview, the higher order theme of increased arousal referred to the imagery function that increased participants' arousal. Three participants experienced increased arousal. The raw data included such phrases as "pumped up," "psyched up," "excitement," "adrenaline," and "heart rate picks up."

During the second set of interventions, three participants experienced more arousal than in the first set. Kevin, in particular, frequently used the motivational function of imagery to increase his arousal: “Definitely [imagery use] with the music I picked, definitely gave me the excitement to get myself pumped up. I definitely felt the adrenaline and the psyched up feeling when I was practicing with music.”

The participants reported that imagery use with music increased their arousal experience. However, in comparison with the first interviews, the participants stated that their arousal was increased by the music, not by the visual images per se. That is, when the participants imaged themselves following the visual imagery guide with music, the music itself facilitated arousal. David stated that “[when I imagine] the song, [it] starts off slow, and then it slowly builds up... You know the music picks up and everything picks up and your heart rate picks up...” This suggested that music could mediate the participant’s emotional state regardless of imagery content (Bishop et al., 2007).

Controlled arousal. The higher order theme of controlled arousal referred to the imagery function that controlled participants’ arousal or reduced their anxiety. The raw data themes that emerged within the controlled arousal theme were “pleasant feelings,” “calming down,” “meditated,” “relaxation,” and “stress relief.” All four participants experienced significant controlled arousal and relaxation during the second set of interventions. As John described it,

I’m strictly kind of imagining the music itself, not the video clip, and then the music itself gave to me a, to get out of the stress, get out from the tightness, and being able to fluidly go through the back stroke and go through the follow through. I think, my perception is, it gave more relaxation... I think more with the music in it, especially a piece of music that I kind of associated with, it gave me more relaxation... listening to music is actually more mediated towards relaxation.

Consistent with David's description of the higher order theme of increased arousal, John said that music helped him relax so that he could putt better. This finding was consistent with research by Beauchamp et al. (2002), which stated that imagery use did not directly affect performance; rather, it changed participants' emotional state, which improved their performance.

Kevin stated that "ironically, the music is kind of hard rock music, but still, for me, it calmed me down." His self-selected music was "Eye of the Tiger" from the soundtrack of the movie Rocky III. This song was typical hard rock music with a strong electric guitar and powerful drums, which was generally considered to be motivating or exciting rather than focusing or calming. However, Kevin said that when he imagined the song, he became excited and motivated, but at the same time he became calmer and more focused because he linked the music to the specific scene in the movie. Kevin's observation about his imagery use with music was consistent with Bishop et al.'s findings (2007) that some participants chose fast music to increase their feeling of confidence, whereas other participants selected a slow tempo song for the same goal. Thus, sport psychology consultants and coaches should consider what types of music are most suitable for individual athletes to use with imagery to achieve specific emotional states or feelings.

Focus. The higher order theme of focus referred to the participants' use of specific images to cope with stressful or challenging situations. The raw data themes that emerged included "blocking out," "background," "humming in my head," "simplifying,"

and “dissociation.” Three participants said that music helped them use imagery more effectively by blocking out other thoughts. As Kevin described it,

When you’re putting, you don’t want to have too many thoughts going through your head. It could affect your ability to visualize, ability to focus, and you know, as you hear the type of things that you’re thinking more in your head, it just complicates things. Music on the other hand, you know, blocks factors out and you can really focus on what you are visualizing and what you’re about to execute.

Pates et al. (2003) found that imagery use with self-selected music was associated with an improved ability to “stay focused and in the zone” (p. 424). These researchers did not discuss this association in more specific terms; however, their results, as well as those of this study, suggested that music could be used with imagery to help athletes focus and concentrate on their performance.

Andrew stated that he used music as a background for imaging:

When I imagine myself, I’m humming [my music] in my head, like I’m humming the tune, but it’s in the background of my head... music in the background, I don’t over-analyze everything. What I think it’s gonna do and just do it. I think it’s just less thinking.

Unlike Kevin, Andrew did not find that music helped him focus. Rather, music in the background debilitated his thinking and interfered with his ability to focus. This finding was consistent with the findings of Bishop et al. (2007) that singing might help athletes dissociate from negative factors.

Confidence. All four participants experienced confidence while participating in the second set of interventions. Kevin’s description of his confidence while imaging putting indicated that he applied his imagery to real images:

[I image] other people looking at me, you know, performing and doing excellent work... Other people are looking at how I perform, you know, I feel excited and psyched up to show them that I can do this and I’m a competitive person, I’m a

confident person and you know I enjoy that kind of feeling and having people look at me that way.

His self-confidence in relation to his competitors is associated with one of the motivation items on the SIQ (Hall et al., 2005).

David stated that music did not change his confidence per se, but it relaxed him so that he had more confidence. Thus when he imagined his music, his confidence increased. His observations supported the suggestion that music could mediate the athlete's emotional state (Bishop et al., 2007).

Overall Effectiveness with Music

The general category of overall effectiveness referred to the participants' experience, in totality, with imagery use with music and putting performance. Two higher order themes emerged in this category: positive and negative factors.

Positive factors. The higher order theme of positive factors referred to factors that enhanced imagery use and putting performance. Participants described these factors using such terms and phrases as "better feeling to be closer to the hole," "character in a movie with this music," "better tempo," "hypnotized," "motivated," and "refreshing." All participants stated that imagery use with music was positively associated with their putting performance. However, three participants reported that imagining did not directly influence their performance. When they imagined specific images, they simultaneously heard the music in their head; or when they imagined the music, it automatically produced images that they wanted to imagine. They then felt relaxed or confident, or relieved of stress, and their performance improved. John specifically stated that music mediated his levels of relaxation and confidence for a better putting performance. This

description was consistent with previous research (Beauchamp et al., 2002) which stated that imagery might mediate confidence to enhance athletic performance.

Negative factors. The higher order theme of negative factors referred to factors that interfered with imagery use, putting performance, and/or application to other situations. The terms and phrases used to describe negative factors included “previous bad performance,” “negative thoughts,” “feeling pressure,” “stress and anxiety because of the end of the program,” “afraid of failure,” and “weather.” For example, Andrew explained that on windy days, he had difficulty using imagery effectively in his actual putting because his imagery had not included adverse weather conditions:

You know it's [the weather is] different every day. Like today is really windy, you know what I imagined, I didn't take into consideration that the wind is blowing everything [balls] to the right today. So what I imagined, I did imagine it the way the putting was, like reading the green, I was reading the greens, but the wind, it didn't [imagery didn't work], I didn't take the wind into consideration.

Because all putting tests were conducted on actual outdoor putting greens, not all conditions were the same as those in the visual imagery guide. Thus when the participants tried to apply their imagery to real situations after imagery practice, the imagery did not work appropriately if the conditions were too different. Therefore, sport psychology consultants and coaches should consider environmental conditions such as the weather when they ask athletes to apply imagery use to real situations.

Some of the participants felt stressed during the second five interventions, and they said that the stress also negatively affected imagery use and performance. As Kevin stated, “we're near the end of the program and I feel I should show improvement. I feel more stress or anxiety about making sure the program is successful.” Both Kevin and

Andrew reported that they sometimes felt more stress on the putting test dates because they pressured themselves to show improved results. These stressful thoughts and feelings negatively affected their performance.

Summary

All participants reported that music helped them vividly visualize what they imaged. That is, music reminded them of specific images related to their performance. These results were consistent with those of Bishop et al. (2007). In terms of imagery perspective, the participants mainly used external imagery; however, as in the first set of interventions, some participants used both the internal and external perspectives. After the second set of interventions, the participants used the cognitive functions of imagery primarily to improve performance, whereas after the first set of interventions they had used them to develop strategies. This use of the cognitive functions of imagery to improve performance was consistent with previous research results (Hall et al., 1998; Munroe et al., 2000). However, only two participants used cognitive imagery in their routines, whereas all four participants had reported using it in the first interviews. Significantly, the participants used more of the motivational functions of imagery in the second set of interventions than in the first set. Music particularly helped the participants mediate arousal (Bishop et al., 2007). In addition, imagining or listening to music indirectly affected the participants' putting performance. That is, music mediated their levels of relaxation or confidence, and their subsequent putting performances were good. Thus imagery may mediate confidence to enhance athletic performance (Beauchamp et al., 2002).

Quantitative Findings

SIQ Findings

This section presents the results from the SIQ (Hall et al., 2005). The four participants' average SIQ scores are shown in Table 1, and each participant's SIQ is given in Appendix L.

As Table 1 shows, the participants' average SIQ scores indicated an increased use of all five functions of imagery. This is partly because, except for David, this was their first experience using imagery with their putting performance. The increase in all five imagery functions was consistent with Gregg and Hall's findings (2006) that all five functions should be used with higher handicap golfers.

The participants steadily improved their use of the MG-A function from the pre-test to the end of the intervention. The MG-A function is related to feelings of relaxation, stress, arousal, and anxiety (Hall et al., 1998). This was consistent with the results of both the first and second interviews in this study, in which all four participants reported using imagery to control their arousal levels.

Table 1. *Participants' average SIQ scores*

Test	Imagery functions				
	CS	CG	MS	MG-A	MG-M
Pre-test	5.0	4.6	3.8	5.0	5.5
First	5.3	5.0	4.0	5.4	5.8
Second	5.4	5.3	4.2	5.8	5.9
Overall change	8%	15%	10.5%	16%	7.2%

In addition, all participants used the CG function of imagery more after the first and second interventions. Considering that the participants were intermediate and advanced level golfers, their use of CG was not consistent with previous research (Callow & Hardy, 2001), which found that less skilled athletes used the CG function more. However, given their age group, the use of the CG function was consistent with Gregg and Hall's findings (2006) that younger golfers used CG, CS, and MG-M functions more than older golfers. This result was also relevant to the multi imagery intervention study on putting performance (Ploszay et al., 2006).

Participants mainly used the MG-M function during the intervention, although it did not improve as much as the MS and MG-A functions. Gregg and Hall (2006) found that younger and more skilled golfers used MG-M imagery more than older and less skilled golfers. Thus the use of MG-M function was consistent with Gregg and Hall's findings.

Results of Putting Tests

Figure 1 shows that each participant changed his putting performance during the period from the pre-test to the completion of this study. The participants had a total of five putting tests: the pre-test, the first test during the first set of interventions (Inter-First in Figure 1), the second test after completing the first set of interventions (After First in Figure 1), the third test during the second set of interventions (Inter-Second in Figure 1), and the fourth test after completing the second set of interventions (After Second in Figure 1).

As Figure 1 shows, only Kevin gradually improved his putting scores from the pre-test to the last putting test. The other three participants' putting scores worsened between the pre-test and the first test. After the first test, David and Andrew steadily improved their scores up through the final tests. John's scores fluctuated and worsened in the tests during both the first and second sets of interventions. However, his final test scores were the best of all the participants.

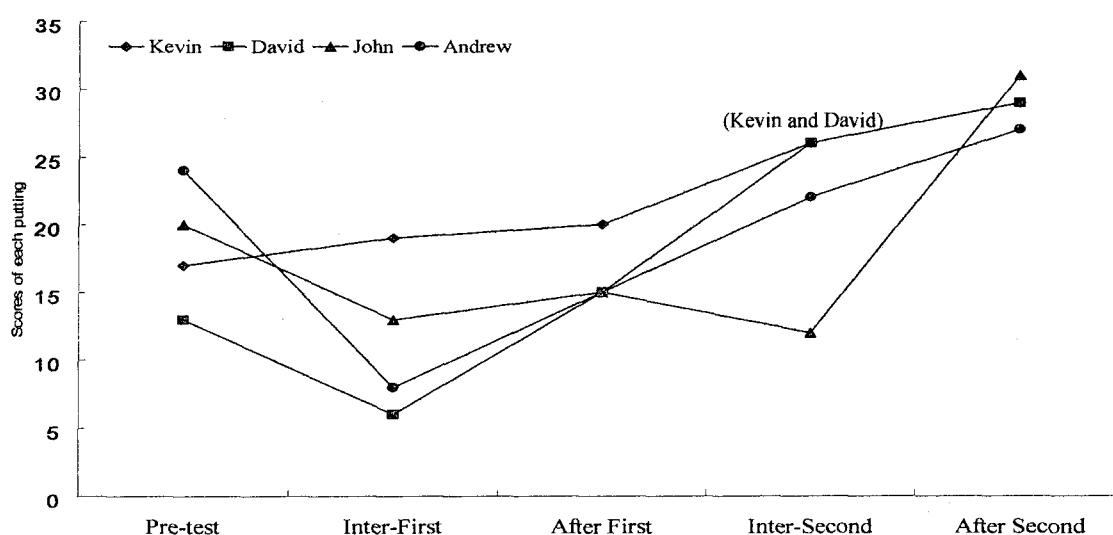


Figure 1. Participants' putting scores during the study

The deterioration of the three participants' scores in the first putting test may have been related to the routine change. In the first interview, all participants reported having new routines for their performance. Two of the participants stated that they had not had any routines before participating in this study. Kevin, whose scores did not deteriorate, explained that his routine had changed slightly, but it was not a new one. Thus the

interview and putting data suggested that the participants' first putting scores worsened in connection with their adoption of new putting routines.

To investigate the overall effectiveness of the study in relation to the participants' putting performance, the researcher conducted a repeated measures one-way analysis of variance (ANOVA). Table 1 shows the mean scores for each putting test. In addition, Fisher's least significant difference (LSD) was used as a post hoc measure. The repeated measures ANOVA showed that there were significant differences in the participants' putting performance between the five tests, $F(1,3) = 5.66, p < .05$. The LSD showed that putting scores after the second set of interventions ($M = 27.8$) were significantly improved over those both during the first set of interventions ($M = 16.3$) and after the first set of interventions ($M = 11.5$).

Table 2. *Mean and standard deviation of putting scores in each test*

	Pre-test	Inter-First	After First	Inter-Second	After Second
Mean (SD)	18.5 (4.7)	16.3 (2.5)	11.5 (5.8)	22.8 (7.2)	27.8 (3.9)

The results of the repeated measures ANOVA showed that the interventions were effective in improving putting performance. In particular, the second set of interventions was associated with significant improvements in putting performance. This result was consistent with Smith and Holmes' study (2002) which indicated that video and audio interventions significantly facilitated putting scores. In addition, the data from both the first and second interviews suggested that music may have been an important factor in the participants' performance. That is, three of the participants mentioned that the verbal instructions, in part, hindered their focus on imagery use, whereas the music helped them

concentrate on imagery use during putting. This result was consistent with the enhanced participant performance associated with interventions consisting of both imagery and music, as described by Pates et al. (2003).

CHAPTER 5

Conclusions

The purpose of this mixed-methods study was to explore participants' experiences with imagery use, and to examine the actual and perceived effectiveness of multiple imagery interventions on golf putting performance. A secondary purpose of this study was to understand the relationship between imagery use and music.

The results of this study suggested the potential efficacy of adding music to imagery interventions in sport situations. For the participants in this study, the addition of self-selected music was associated with an enhanced ability to visualize successful putting. Music gave the participants relevant cues by providing a more vivid connection to their specific performance imagery. This was consistent with previous research by Bishop, Karageorghis, and Loizou (2007) indicating that participants experienced specific visual images when they listened to self-selected music.

The participants also reported that when they imagined or listened to their self-selected music, it helped them clear their heads of thoughts unrelated to the putting task. Thus the participants were able to imagine clearly, and to be relaxed and confident.

Therefore, the study results suggested that music could enhance visual imagery ability and at the same time improve motivational functions of imagery. Furthermore, this effectiveness of music in imagery use was associated with a positive change in emotional state. As the participants reported in their second interview, music mediated their emotional levels such as confidence or arousal. This positive change in emotional state helped them improve their putting performance. This result supported previous

findings by Pates, Karageorghis, Fryer, and Maynard (2003) that interventions consisting of both imagery and music enhanced participant performance. It also supported research by Bishop et al. (2007) that music could mediate the athlete's emotional state. Finally, it was consistent with previous findings that imagery might mediate confidence to enhance athletic performance (Beauchamp, Bray, & Albison, 2002).

Auditory imagery, as a motivational function, was used to achieve a goal. The participant who experienced auditory imagery use felt that it was a very strong relevant cue to help him visualize and achieve success in putting. This finding was in line with previous research by Smith and Holmes (2002) suggesting that putting performance improved significantly with the use of imagery guides that included audio information.

The results of this study indicated that the participants' daily sense of their physical condition had a strong effect on their imagery use. Even if they imaged correctly and properly, when they experienced unpleasant physical sensations such as muscle tension or soreness, they concentrated on this rather than on their imagery. Two participants reported that negative thoughts and images disturbed their imagery use in putting performance. This matched Taylor and Shaw's suggestion (2002) that golfers should avoid negative imagery because it was strongly associated with reduced performance and self-confidence.

Finally, one participant mentioned that he would apply the combination of imagery and music to situations in his real life. This suggests interesting possibilities for expanding the future application of sport psychology imagery interventions.

Recommendations for Future Study

Based on the results of this study, the researcher would make the following recommendations regarding the design of future research and the application of imagery use. The repeated measures ANOVA showed that the multiple interventions within the study significantly improved golf putting performance. Although all putting tests were conducted on actual outdoor putting greens, the inclusion of regular putting tests might have affected participant putting performance. Two participants stated that, while the imagery interventions positively affected their putting, their performance might also have improved because this study was the first time they had ever practiced putting regularly. Thus future research should consider the frequency of performance or practice related to the study procedures. If the research design includes more practice time than is normal for the participant, the difference in practice frequency will be an extraneous variable. Moreover, future research should have a control group to investigate the practice effect during interventions on participant performance.

In addition, future research should consider whether the participants use polysensory imagery ability. According to the data from the first interview, one participant, David, used auditory imagery more often than visual or kinesthetic imagery, which was purposely emphasized and included in the visual imagery guide. Although the visual imagery guide included visual instructions, verbal instructions, and the actual sound of a putt holing in, he reported that he intentionally focused on the sound and used it for his imagery. Therefore, future interventions should consider the types of imagery

abilities that participants already use most frequently in order to improve imagery use for optimal performance.

Moreover, the interview data suggested a need for more research into the relationship between athletes' physical condition and their imagery use. In this study, when participants experienced their physical condition negatively, it affected both their imagery use and putting performance. It may be true that an athlete's sense of his or her physical condition varies from day to day. However, as far as the researcher can determine, no previous research has studied the correlation between imagery use and the sense of physical condition. Since a primary purpose of imagery use in sport psychology is to enhance athletic performance, the correlation between imagery use and physical condition could be a topic for future research.

In addition, further study is needed to investigate how individual athletes interpret and use imagery functions. For example, in theory, the cognitive functions are typically used for skill acquisition and development. However, according to the results of previous research (Evans, Jones, & Mullen, 2004; Short, Monsma, & Short, 2004) and this study, participants use motivational functions for skill acquisition. Thus, if coaches or sport psychology consultants consider that each athlete may use the same function of imagery differently, they can design individualized imagery interventions for each athlete. These personalized interventions might be particularly effective in optimizing both imagery use and performance.

Future research is also needed into how imagery use with music might affect teams as opposed to individual participants. The results of previous research (Bishop et

al., 2007; Pates et al., 2003) and this study indicated that the combination of imagery and music enhanced participant imagery use. However, these studies addressed only individual improvements in imagery use in relation to performance. In addition, each participant chose different music for the same goal. One participant chose a fast song for self-confidence, whereas another participant selected a slow tempo song for the same purpose. If coaches and sport psychology consultants use the same song with imagery for an entire team, it is unlikely that this song will affect everyone equally. Therefore, future research could investigate ways to select music for a team as whole. This could lead to the development of team-oriented imagery interventions with music, which could possibly enhance team strategies for competition and team cohesion.

Finally, future research needs to investigate how imagery use in sports can be applied to other life situations. In this study, one participant, Kevin, decided to use his intervention techniques in other areas as well as in his golf game, for example, to increase arousal, reduce anxiety, and increase self-confidence. If future research reveals ways to apply the imagery techniques from sport situations to other life situations, researchers will have diverse areas of imagery-related study. In addition, if coaches and sport psychology consultants in youth sport fields can teach young athletes to use imagery in sport situations, these athletes can use the same techniques to manage other life situations. Thus, the application of imagery use with music can be expanded from performance enhancement to an actual lifespan skill.

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Appendix A

The Five Functions of Imagery Use (Hall, Mack, Paivio, & Hausenblas, 1998)

<p style="text-align: center;">Cognitive Specific (CS)</p> <p>The mental rehearsal of specific sport skills</p>	<p style="text-align: center;">Motivational Specific (MS)</p> <p>Imaging to achieve one's goal or goal oriented behavior</p>
<p style="text-align: center;">Cognitive General (CG)</p> <p>The mental rehearsal of strategies and game plans</p>	<p style="text-align: center;">Motivational General-Mastery (MG-M)</p> <p>Imaging oneself overcoming a challenging situation or representing effective coping, such as being confident and focused</p>
	<p style="text-align: center;">Motivational General-Arousal (MG-A)</p> <p>Imaging and addressing the arousal and anxiety associated with participating in sport</p>

Appendix B
Demographic Questionnaire

1. Name:
2. Date:
3. Age:
4. Year in School:
5. Golf Handicap:
6. Years of golf experience:
7. Have you received any golf instruction before?
8. How often do you practice golf?
9. Have you played on a golf course?

 If yes, how many times and how often?
10. Do you know how to use your imagery when you play?
11. Have you had imagery use instruction/intervention before?
12. Would you be interested in participating in this study (the study will include short interviews)?

 ___ YES; I am interested in this study and will consider being interviewed.
 ___ NO; I am not interested in this study.
13. If YES; please provide your phone number and email address so I can contact you.

 Phone Number: () _____
 Email: _____

Appendix C

Sample of the SIQ (Hall, Stevens, & Paivio, 2005)

1. I make up new plans/strategies in my head.
2. I image the atmosphere of winning a championship (e.g., the excitement that follows winning a championship).
3. I image giving 100%.
4. I can consistently control the image of a physical skill.
5. I imagine the emotions I feel while doing my sport.
6. I imagine my skills improving.
7. I image alternative strategies in case my event/game plan fails.
8. I image myself handling the arousal and excitement associated with my sport.
9. I imagine myself appearing self-confident in front of my opponents.
10. I imagine other athletes congratulating me on a good performance.

Appendix D

An Example of the Interview Guide after the First Five Imagery Interventions

1. Can you tell me about your imagery use after the first imagery intervention sessions?
(General)
2. Could you see or feel clearly what you imagine? (Visual and Kinesthetic)
3. How did you imagine yourself and your performance? (Internal and External)
4. Can you describe your use of imagery to rehearse and execute putting strategies?
(Cognitive)
5. Can you describe your use of imagery to control arousal and stress?
(Motivational)
6. How was your confidence before and after the interventions? (Confidence)
7. Were there any parts of your imagery that you found challenging to perform?
8. Do you think the imagery interventions have positively affected your golf putting performance regardless of the number of putts holed in?
9. Any other comments about your imagery use?

Appendix E

An Example of the Interview Guide after the Second Five Imagery Interventions

1. Can you tell me about your imagery use after the second imagery intervention sessions? (General)
2. Could you see or feel clearly what you imagined? (Visual and Kinesthetic)
3. Could you imagine yourself and your performance? (Internal and External)
4. Can you describe your use of imagery to rehearse and execute putting strategies? (Cognitive)
5. Can you describe your use of imagery to control arousal and stress? (Motivational)
6. Do you think listening to music helped your imagery use or mediated your confidence? (Confidence)

If yes, do you think it enhanced your putting performance?

If no, how did it interfere with your putting performance?
7. Were there any parts of your imagery that you found challenging to perform?
8. Do you think the imagery interventions have positively affected your golf putting performance regardless of the number of putts holed in?
9. How would you compare the two different imagery interventions?
10. Any other comments about your imagery use?

Appendix F

Imagery Intervention Guide based on previous research (Smith & Holmes, 2004; Ploszay, Gentner, Skinner, & Wrisberg, 2006)

Imagine that you have just replaced your marker and are standing on the green putting surface. Your ball is at a 12-foot distance from the hole, and the distance is very comfortable and easy for you to hole in. Read the green, see which way the ball is going break, and decide on the spot where you will aim and putt. Visualize and imagine your ball rolling into the hole, and hear the sound when it holes in. You feel very confident and convinced about your reading of the green.

Walk close to the marker, replace your ball, and line up the ball toward the spot. Before your actual putt, do a practice swing. Stand behind the ball and grip the putter in your usual manner. Draw an imaginary line from your ball to the spot and place the putter perpendicularly behind the ball. You feel a light tension in your upper arms and shoulders, but you are comfortable. Check your body alignment; see that your feet, knees, and shoulders are parallel to the imaginary line. Move the putter back and forth just as in your actual swing. Feel your shoulders, arms, and wrists as one unit; they move together like a pendulum. This is a perfect swing, and the players around you see your confidence. Visualize that your imaginary ball rolls into the hole when you move the putter forward and hit the ball, but keep your head down and maintain it. You can see your whole putting motion as a film.

Let's do the real putt. You are very calm and comfortable in your mind now, and you can make this putt with ease. Replace the putter behind the ball, stand as you do normally, align your body, and take a second look at the hole. Check your body alignment once more; everything is perfectly set up. Keep your head down, look at the ball, and maintain it when you hear the clicking sound as the ball rolls into the hole. Feel that your body is relaxed and balanced, and you are more confident. Also feel that your upper body moves like a pendulum. Move the putter back and forth just as you rehearsed, smoothly and confidently. You can see and feel your putter hit the ball, and

hear the sound when it makes contact with the ball. See the ball roll into the hole, and hear the clicking sound as it holes in. You can see your whole successful putting sequence as a film. You feel stronger, more confident, and proud of yourself. You can hear the other players applaud you. You know you can make the same distance putt any time in the future.

Appendix G

Study Procedures

1. Pre test: 10 test putts from 12-foot (3.66-m) distance → SIQ



2. First Five Imagery Intervention Sessions without Music

Day 1	Day 2	Day 3	Day 4	Day 5
Self-Practice	Self-Practice	10 practice putts from 12-foot distance → 15-minute imagery intervention → 10 test putts from 12-foot distance	Self-Practice	10 practice putts from 12-foot distance → 15-minute imagery intervention → 10 test putts from 12-foot distance → SIQ and interview



3. Second Five Imagery Intervention Sessions with Music

Day 6	Day 7	Day 8	Day 9	Day 10
Self-Practice	Self-Practice	10 practice putts from 12-foot distance → 15-minute physical rehearsal with music (no imagery intervention) → 10 test putts from 12-foot distance	Self-Practice	10 practice putts from 12-foot distance → 15-minute physical rehearsal with music (no imagery intervention) → 10 test putts from 12-foot distance → SIQ and interview

Appendix H

Agreement to Participate in Research

Responsible Researcher: Seongkwan Cho, M.A Candidate, Department of Kinesiology, San José State University

Title of Protocol: A qualitative study of imagery intervention with music use on golf putting performance

1. You have been asked to participate in a research study investigating the experiences of imagery use on golf putting performance after different interventions.
2. You will be asked to participate in 5 sessions in consecutive two weeks:
 - (a) Pre-test (approximately 10-20 minutes including putting test and the completion of one questionnaire)
 - (b) First two imagery interventions (approximately 30 minute first session including an imagery intervention, putting test, and the completion of one questionnaire, and approximately 1 hour and half second session including an imagery intervention, putting test, and the completion of one questionnaire, and a 40-60 minute interview)
 - (c) Second two imagery interventions (approximately 30 minute first session including an imagery intervention, putting test, and the completion of one questionnaire, and approximately 1 hour and half second session including an imagery intervention, putting test, and the completion of one questionnaire, and a 40-60 minute interview)
3. You will also be asked to practice putting performance at least 3 times during each week.
4. You will be asked to keep a diary during your participation and submit the diary at the end of the study.
5. You will be asked to respond to several interview questions during a semi-structured interview session. The interview will be audio taped and arranged at my convenience.
6. You will receive a \$25 Golfsmith gift certificate upon completing all five sessions of this study.
7. There are no anticipated risks associated with participation in this study.
8. While there are no expected benefits associated with participation in this study, you may improve either putting performance or imagery use, or both.
9. Although the results of this study may be published, no information that could identify you will be included. You will be referred to only by a code name of your choice.

Initial _____

10. Questions about this research may be addressed to the researcher, Seongkwan Cho at (213) 703-0525 or Dr. Ted M. Butryn, Thesis Chair at (408) 924-3068. Complaints about the research may be presented to Dr. Shirley Reekie, Chair of the Department of Kinesiology, at (408) 924-3020. Questions about research subjects' rights or research-related injury may be presented to Pamela Stacks, Ph.D., Associate Vice President of Graduate Studies and Research, at (408) 924-2427.

11. No service of any kind, to which you are otherwise entitled, will be lost or jeopardized if you choose to "not participate" in the study.

12. Your consent is being given voluntarily. You may refuse to participate in the entire study or in any part of the study. You have the right to not answer questions you do not wish to answer. If you decide to participate in the study, you are free to withdraw at any time without any negative effect on your relations with San Jose State University or with any other participating institutions or agencies.

13. After you receive and sign two consent forms, you will receive one for your records, signed and dated by the researcher, and the other to return to the researcher.

"I, _____, have read the above
(Full Name)

statements, and by signing and dating my name above the researcher's name and date, I am giving my consent for the researcher to use my information for the benefit of the study."

Participant's Signature

Date

Researcher's Signature

Date

- The signature of a subject on this document indicates agreement to participate in the study.
- The signature of a researcher on this document indicates agreement to include the above named subject in the research and attestation that the subject has been fully informed of his or her rights.

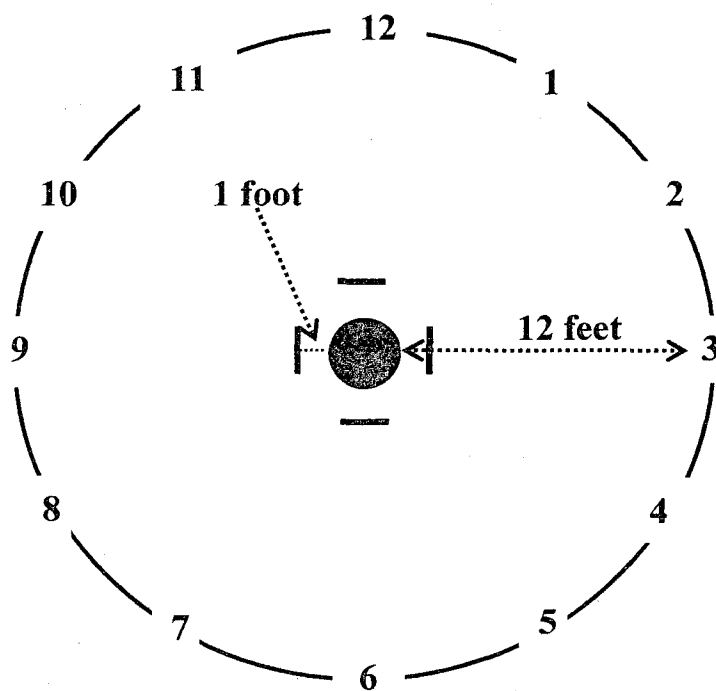
If you wish to receive a summary of the findings of this research, which will be available around July 2009.

Yes ____ No ____

Address

Appendix I

Distances and 12-foot Markers for Putting Tests



Appendix J

Thematic Analysis of the First Interview
Based on Imagery Components and the SIQ

General Categories	Higher Order Themes	Raw Data Themes
Imagery Ability	Visualization	Could see (3)/visualize/watching/looking Spinning in my head Visual connection More clear because of being a visual person
	Feeling of Force	Feel the amount of force How hard I have to hit it
Imagery Perspective	Internal	Aim towards the line Concentrate on the ball Internally imagine Imagine (looking at) the hole Imagine the putter head swinging back and forth (2) Look at the ball marker and the line to the hole Only see the putter/ball
	External	Third person's view Imagining myself
Cognitive	Imagine Performance	Visualizing it before I do it
	Read Line on Green	Where the line is
	Strategy	Draw the line and practice the putt Think about strategies Strategize myself
	Consistent New Routine	Preparation Consistent routine (3) Practice strokes as part of my routine Visualize and follow the visual guide
Motivational	Auditory Imagery	Hear that clicking sound as a reward
	Increased Arousal	Arousal Excited/excitement (2)
	Confidence	Confidence (4)/self talk/perceiving and showing confidence
	Focus	Focus

Overall Effectiveness	Positive Factor	Closer to the hole Good rhythm Good physical condition Can apply in different ways and in different parts of life
	Negative Factor	Physically not good response (2) Negative image (2) Negative thought (2) Don't feel confident

Appendix K

Thematic Analysis of the Second Interview
Based on Imagery Components and the SIQ

General Categories	Higher Order Themes	Raw Data Themes
Imagery Ability	Visual Connection	Visually seeing the movement related to the music (2) Overlaying the image Matching the image
	Clearness	Seeing more by thinking less Seeing more clearly because music cleared the head
	Positive Feeling	Good feeling Relaxed feeling
Imagery Perspective	Internal View	First point of view (2) Imagining a ball and a putter Moving a putter and hitting a ball (2)
	External View	As other people looking at me Third person's view (3)
Cognitive	Performance Improvement	Getting an even rhythm and tempo Reading the line (2) Performance improvement
	Routine	Checking the routine Going through the routine Stable routine
Motivational	Goal Setting	Sinking the putt Focusing on the hole Energy to make the putt
	Increased Arousal	Pumped up Psyched up Excitement Adrenaline Heart rate picks up
	Controlled Arousal	Pleasant feeling Meditated (2) Calming down Relaxation (4) Stress relief (2)
	Focus	Blocking out (3) Dissociation Background

		humming in head Simplifying (not thinking things) (2) Focus on (2)
	Confidence	Confidence (4)
Overall Effectiveness with Music	Positive Factors	Better feeling to be closer to the hole (2) Character in a movie of its music Better tempo Hypnotized Motivated (2) Refreshing
	Negative Factors	Previous bad performance Negative thoughts Feeling pressure Stress and anxiety because of the end of the program Afraid of failure Weather

Appendix L

Participants' SIQ Scores

From the pre-test, after the first intervention, and after the second intervention

<Kevin>					
	CS	CG	MS	MG-A	MG-M
Pre-test	5.9	6.0	5.2	6.0	6.8
First	5.6	6.0	5.4	5.8	6.2
Second	5.7	6.2	5.8	6.5	6.3
<David>					
	CS	CG	MS	MG-A	MG-M
Pre-test	5.9	5.3	6.0	7.0	5.8
First	5.7	5.8	6.4	6.7	6.3
Second	6.0	6.0	6.4	7.0	6.2
<John>					
	CS	CG	MS	MG-A	MG-M
Pre-test	3.4	3.3	1.0	2.0	4.2
First	4.9	3.5	1.0	3.0	5.2
Second	5.0	4.3	1.0	4.0	6.0
<Andrew>					
	CS	CG	MS	MG-A	MG-M
Pre-test	4.7	3.7	2.8	5.2	5.0
First	5.0	4.7	3.2	6.0	5.5
Second	4.7	4.8	3.4	5.8	5.0